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ABSTRACT

This manual provides information to help libraries in Texas considering an automation project, with special emphasis on smaller libraries. The solutions discussed are microcomputer-based. The manual begins with a discussion of how to prepare for the automation of a library, including planning, approval, collection decisions, policy, and staffing. The planning process is examined in detail and essential components of an automation plan are identified: needs assessment, goal, constraints, outline, schedule, budget, staffing, and public relations. Procedures for the conversion of the three basic types of data--title, item and patron--are suggested. Next, steps are presented for a small library to follow when procuring an automated system, including product demonstration, functional specifications, and contract clause discussion. Finally, the implementation considerations of site preparation and training are presented. Appended materials include Retrospective Conversion Options; To Manually Input or Purchase Bibliographic Records; Functionality of Microcomputer-Based Integrated Library Systems; Sizing Your System; Sample Configuration Costs; The Proper Training Approach for Adults; Local Area Networks; Glossary of Microcomputer Terms; and Bibliography. (Contains 101 references and a list of 13 journals.) (JLB)

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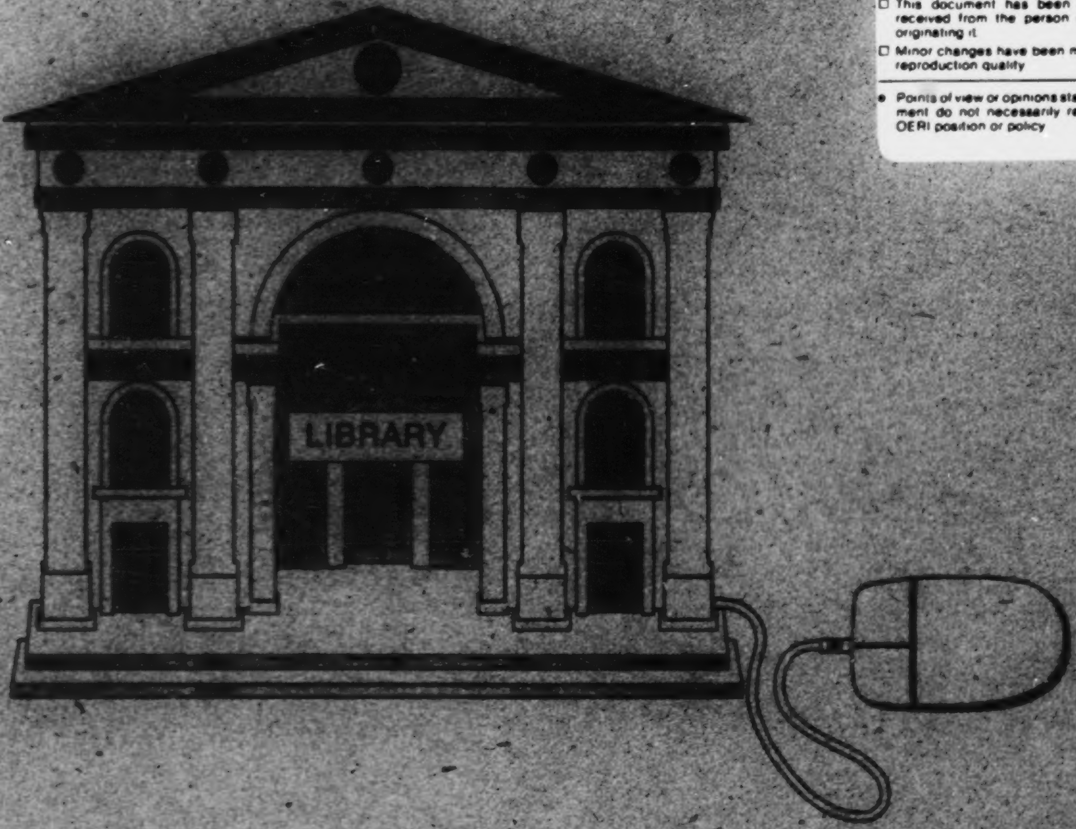

A Manual from the Library Development Division
of the Texas State Library

IR055261

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SMALL LIBRARIES ONLINE:

Automating Circulation and Public Access Catalogs

Based on the workshop developed by:

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Library Development Division
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INTRODUCTION

The automation of small libraries is, in some ways, no different than the automation of larger libraries. The same basic steps should be followed and addressed. The major differences include the size of the collection, the size of the library staff, and the type of solution chosen.

Much information in this manual will be helpful for any library considering an automation project. It will be focused, however, on the issues that are normally encountered by smaller libraries. In addition, the solutions discussed will be microcomputer-based. Those needing further information should contact the Automation Consultant at the Texas State Library (512/463-6627).

All materials cited in this manual can be obtained through the Library Science Collection at the Texas State Library (800/252-9386).

Many thanks go to C. Rebecca Garcia and Frank R. Bridge, who originally created this manual and the workshop for the Texas State Library. They were able to give me a solid basis from which to work. As she presented the workshop, Holly K. Gordon produced other handouts which complemented the information in the manual. These have now been incorporated into the revised manual.

The editing talents of Edward Seidenberg, Jeanette Larson, Mark Smith, Anne Ramos, and Susan Thompson were used unashamedly. Thanks should also go to Kay Easter, Sharon Dennis, Cyndi Holder and Sarah Woelfel for the word processing of numerous drafts.

PREPARATION FOR AUTOMATION

"We don't have money for automation yet. Is there anything I can do NOW that will help if we automate LATER?"

In many instances, the library staff would like to automate and may be looking forward to automation, but no resources will be available in the foreseeable future. This is normal and shouldn't be seen as a stumbling block, but as an opportunity to prepare. Believe it or not, there are libraries that are thrown into automation by being given extra money which must be spent immediately! You may wish you were in that situation, but there can be wasted effort and money if a certain amount of preparation has not been done. The following should give you some ideas you may wish to implement in your library.

PLANNING

Begin now writing your long range automation plan for the library. Within this plan, you should, among other things, answer the question, "Why should this library automate?" Automation should not be an end in itself. In other words, stating that you are automating just to automate will not garner support for the project from your patrons and funding authorities. Think beyond this project to what you hope to accomplish by completing the automation project.

In order to plan the automation project properly, it is necessary to understand the parts of the project and how they fit together. This means education. The following are just three situations which will require planning.

1. The hardware and software should have already been received when the installer arrives.
2. The bibliographic data should already have been converted by the time the public access catalog is implemented.
3. The process of cataloging ongoing materials should be decided before implementing the system.

These are just some of the logistics which need to be considered. Planning will help you through the logistics and finances with a much brighter disposition and much more sleep!

APPROVAL

After having created a good plan, it's time to approach your funding authorities. By "funding authorities," I mean those people who provide money for new projects. Your funding authority could be your city council, your school administration, your library board, or your college faculty. If they agree with the plan and understand your project from the beginning, they will be able to work with you in furthering the project. When extra money is found, they will already know your intentions which may help in obtaining funding. They may also be helpful in finding alternative funding sources who could work with them in furthering your project.

COLLECTION

Weeding

Converting bibliographic information into machine-readable form will be a major cost. Consider that the cost for conversion can be between $.50 and $1.00 per title. If, in a collection of 20,000 titles, 10% should be weeded, the savings will be between $1,000 and $2,000. By weeding your collection before data conversion, you will not only save money, but remove the "dead wood" sitting on the shelves.

Inventory

Why do an inventory manually when it is so much easier after automation? This, again, goes back to cost savings. The information you use for conversion should be accurate. Are you going to send your shelflist to a vendor or use it for an in-house conversion? Then the shelflist needs to be accurate. Do you have an in-house automated system which uses bibliographic records? Then these bibliographic records need to be accurate.

For example, if your shelflist states your library owns three copies of *Old Yeller* and you actually own two, your patrons will see three copies on your automated system and you will have to make time to correct it. If your shelflist states your library owns *The Great Gatsby* but it has actually been lost for some time, your patrons will still see the title in your automated system. In this case, you would have paid to have a record converted for which you have no book and you will again need to correct it. Just think of the old adage, "garbage in, garbage out!"

Shelflist

Accuracy of your database, whether it be your shelflist or machine-readable records, is of paramount importance. In addition to cleaning up this database, consider adding the LCCN (Library of Congress Control Number), the ISBN (International Standard Book Number), or the ISSN (International Standard Serial Number) to each title. By providing standard numbers, the conversion will be much easier and could be much less expensive. If an LCCN/ISBN/ISSN cannot be found for an item, be sure the bibliographic information is correct, e.g., author, title, publisher, date.

Call Numbers

Are call numbers consistent in your collection? Do you have some biographies under B, some under 92, and some under 920? Think about the fiction, mystery, and local history collections. An automated system does not care which call number you use, but your patrons will appreciate the consistency. After this decision has been made, write it down so that new materials will be classed consistently.

POLICY

Start reviewing your policies. Identify the reasons for the policies which are currently in place. If the reason is "this is the way we've always done it," start re-evaluating the policy. Perhaps it needs to be changed. Start discussing these issues:

Will all library materials be reflected in the public access catalog?
Will just circulating material be reflected in the public access catalog?
Will paperbacks be reflected in the public access catalog?

Will all library materials be barcoded?
Will just circulating materials be barcoded?
Will materials that do not belong to the library, e.g., reserve material, be barcoded?

Where will barcode labels be attached for books? for magazines? for videos?
How long should the loan period be for patrons?
Is the overdue fine too low? too high?
What information will be needed for the re-registration of patrons?

These questions will raise other issues. Automation will change many things. Do not be afraid to change the way your library operates in order to take advantage of the functions of your automated system and provide better service for your patrons.

LIBRARY OF CONGRESS SUBJECT HEADINGS

The *Library of Congress Subject Headings (LCSH)* has become the *de facto* standard for automated systems. Other subject headings schemes are accepted by automated systems, but it may be more expensive and more time-consuming to maintain them. Most of the Machine-Readable Cataloging (MARC) records that will be loaded into your system will use *LCSH*. Providing other subject heading schemes will either mean your time will be spent in subject analyzing materials or your money will be spent in having a vendor supply these headings. Now is the time to start learning to love *LCSH*! Do not convert until you are automated, but begin mentally preparing your staff and yourself for this change.

BUILDING

Will the physical structure of your building have to be modified? Think about the number of public and staff workstations that will be necessary. Each workstation must have an electrical outlet and some type of cabling. If you will be using existing phone cables, determine if there are enough, or if more should be installed. If you will need other types of cables, determine the modifications that will need to be made. Will there be room in your circuit box for a separate circuit? Where will you place the computers? Do you have space, or will the library need to be rearranged? Do you have tables and/or chairs for these computers? Have you considered access for the disabled? Your local telephone company, or a network specialist (usually found under "Computer Networking" in the phone book) should be able to help you.

STAFFING

Begin educating yourself and your library staff. Workshops, seminars, and conferences are great ways to gain a basic understanding and help fend off any fears of automation. Visit other librarians who have been through the automation process. Think about the tasks that will comprise the automation project itself. Who will be in charge of the project? Do you have any technical expertise in-house? Is there anyone outside the library whose expertise would be valuable?

PUBLICITY

As soon as you have your plan and have received approval from your funding authorities, start selling automation to your public! Begin educating them by explaining the advantages for them personally. Let them know there is a need for automation and explain why. Remember that your feelings about automation will transfer to your patrons. If you are hesitant and unsure, then your patrons will adopt that attitude and the acceptance of automation will take much longer. Remember, your patrons are your support at bond elections and budget hearings, so don't neglect them in the planning stages!

DO NOT. . .

Start Conversion Too Early

Data conversion should not be done until you know that automation is likely to take place within the next year or so. Once data conversion has begun, there is usually no way to modify or delete those bibliographic records. For example, if your library has been receiving bibliographic records on floppy disks from your book vendor for the past four years, then how easy will it be to delete a specific title when it is weeded or missing? Without software to read the disks, it is very difficult. If these records do not accurately reflect your current collection, then all or part of the conversion may have to be done again.

Barcode Before Choosing A System

At this point, not all library automation software can read all types of barcode symbols. By barcoding your collection before choosing a software package, you may be limiting your choice of software.

Be Impatient

The last thing you want to do is purchase a system which your library will outgrow in two years or which does not provide functions which are necessary for your library. Be sure the system purchased will provide room to grow in both the hardware and the software and will provide the functionality necessary. Anything else will make you and your patrons miserable.

Based on *What To Do While You're Waiting To Automate* by Holly K. Gordon, Texas State Library, February 1991.

PLANNING

Are you ready to automate your library? Great! What should be your first step? Should you begin purchasing microcomputers? Should you start looking at library automation software vendors? Should you allocate money in order to fund this project?

While most of these activities are important and will be done eventually, your first step should be much more basic. Education is the key to any project, particularly in library automation. Embarking on a library automation project often points out how little we actually know about automation. That's fine, almost everyone has been there. This realization will help you slow down and consider your actions rather than proceeding without proper thought.

What are ways you can start educating yourself? The following is a list of some activities:

For basic information, contact the librarian at the Texas State Library's Library Science Collection (800/252-9386).
Read manuals like this one which are specifically geared toward beginning users.
Read books about library automation.
Read the automation articles in professional journals.

Attend workshops on library automation.
Attend conferences that will deal with automation topics.

Visit exhibits at conferences.
Visit libraries that have already automated.

Speak with librarians who have already automated.
Begin to set up a network of people to call for assistance.

Have you ever found yourself in your car with the engine running, about to turn out of the driveway, and suddenly realized that you don't know where you're headed? That is much like implementing an automated system without a plan. You could have the money to automate, a willing and excited staff, and patron support, but if you don't know exactly how the project will unfold, time and money will be wasted. In order to properly plan for an automated system, there are a few questions which should be considered.

What do you hope to accomplish?

What are the goals for this project?

How does it fit in with overall organizational goals?

How does it help the library in realizing long term (five-year) goals?

These questions, and others, can be answered in the library's long range plan. Particularly during a time of budget cut-backs, all projects must support the mission of the institution. It is much more difficult to fund a project which does not directly support this mission. An automation project is no different. It should support and enhance the mission of the library.

Not only is it desirable to include automation in the library's long range plan, but sometimes it is helpful to create a long range plan specifically for automation. If automation in your library will be seen as more than a public access catalog, then this specific type of long range plan will be particularly useful. Instead of being swayed with each new piece of technology, this plan will help you keep your goals before you so your purchases will be supported both by the long range automation plan and the library's long range plan.

A long range automation plan can also be extremely helpful in identifying your library's needs and expectations. Often, someone outside the library determines what will best serve the library's needs. If an accepted long range plan is already in place, it is much easier to counter those ideas. Showing that the alternatives have been carefully evaluated and that automation is the best answer for your library is the best response in this situation. Although it is difficult to believe, even libraries "come into money" at times. If a plan is in place detailing how that money could be spent, it is much more likely you will retain the use of it. For more information on creating a long range automation plan, contact the Texas State Library for *Down the Road . . . Long Range Planning for Automation*.

The automation project can take on a life of its own. It becomes the "end," or the goal, rather than the "means to the end." The process of automation should be the means for providing more effective and efficient library services, not the means for providing library automation.

To be sure you have your priorities straight and to help you convince your patrons and funding authorities of the worth of an automation project, an automation plan is essential. The writing of the plan will make you think seriously about the details and possibilities of the automation project and will give others a written document which will answer many of their questions.

Before writing a plan, however, you should understand some things about automation.

> **Automation will not solve personnel or other organizational problems.**
>
> If you have severe organizational, personnel, or procedural problems, automation will exacerbate rather than eliminate them. By studying the situation during the long range planning process, you will be able to address these non-automation related problems separately. Let the benefits of automation stand on their own to justify purchase of the system.
>
> **Automation will not save money or allow you to significantly cut staff.**
>
> There will be savings in certain manual transactions. In addition, tasks of some staff will be made obsolete by automation, e.g., the filing of cards. However, since small libraries rarely have such specialized staff, are generally understaffed anyway, and since automation requires other duties, very few libraries ever experience an overall decrease of staff. In fact, in some larger libraries, while one or two clerical employees may be laid off, an automation coordinator is often added to the staff at a much higher salary.

Automation is expensive.

Many ongoing costs of automation are overlooked in the zeal to embrace the technology. Automation may bring with it new expenses such as software support and dedicated phone lines. While these may not be present in every case, rest assured that the amount quoted to you by the automation vendors will not include all associated costs of automation.

Automation is not for everybody.

Finally, remember that since automation is not a cure-all, it is not for everybody. If you are willing to expend the labor and if the time and expense can be justified, you will be very pleased with automation. However, if you are being pressured into automating because the library down the street installed a computer, it's time to step back and determine the usefulness of automation for you. While automation can be very beneficial in many cases, there are priorities in every situation and sometimes, automation is not the prime objective.

It is important to keep the role of automation in perspective. It is just a means to an end. The goal should be the provision of better service. Automation is only one of many ways to fulfill that goal.

In creating a plan which will be useful, take into account both the needs and realities of a smaller library. If the following basic steps are followed, they should provide you with enough information to successfully manage an automation project. If you have the time or staff, you should consider doing a more detailed plan, possibly using one of the sources in the bibliography.

AUTOMATION PLAN

A plan should include the following components:

NEEDS ASSESSMENT

This is a statement of the problems or challenges perceived currently, the alternatives considered, and the course recommended. It will help you determine what you want your system to do. It will identify those areas of your library that require more or less attention than they presently receive. The term "needs assessment" has been used to include a step of the automation project which consists of identifying functional capabilities, or specifications. For the purpose of this manual, however, a needs assessment will be used for identifying problem areas in your library. We will discuss determining the functional specifications in the chapter on procurement.

To determine whether automation will be cost effective and to set goals for automation, libraries often find it helpful to conduct a needs assessment. There are three basic steps:

1. **Identify existing problems in different functional areas of the library.**

   Consider the areas of circulation and the public access catalog. What problems or challenges come to mind? Students may forget to return material which results in a large backlog of notices to be delivered. You may have an annual circulation of over 100,000 with a staff of three. In either case, you are faced with clerical tasks that are time-consuming and tedious.

   Once you have identified problem areas, be specific. Detail the functional activities that seem inefficient. For example, rather than just stating "circulation is a problem," specify what aspects of the process are problematic. A first step would be to define the term "circulation." This could mean the charging of a book, as well as the filing of the card indicating that the book is charged. It may not include sending out overdue notices or discharging the books.

2. **Time library activities related to problem areas.**

3. **Cost library activities.**

   Once you have identified the problem area(s) to be addressed, it is helpful to know how much time is spent in each area. Some sources discuss specific costing of each activity as well. If you have the time to do this, I would wholeheartedly recommend it. Time the activities you are studying, then "cost out" the resources involved in performing the activity, and compute a unit cost of service.

Using these three steps, the following is an example of a needs assessment for circulation.

The Bridge Memorial Library has a card system in use that requires the patron to write their name on each card in order to charge the book. The cards are then filed by date due. This circulation activity is timed and is found to take, on an average, one minute to charge a book. It also takes about one minute to file each card. Therefore, it takes two minutes to circulate a book. Stated another way, thirty books can be charged per hour.

A circulation clerk takes care of the area. She is paid $4.45/hour; including benefits, she makes about $4.90/hour. In order to determine the cost of the circulation clerk's time in charging a book, use this formula:

Hourly Wage ÷ Volume = Unit Cost

$$\text{\$4.90/hr.} \div \text{30 books/hr} = \frac{\text{\$4.90}}{\text{30 books}} = \text{\$0.16/book}$$

It costs $0.16 for the circulation clerk to circulate one book.

In the circulation process, each card costs approximately $0.03; if used twelve times, each use costs $0.0025. Including other supplies such as pencils, filing drawers, and flags, let's assume the total cost for supplies is $0.01/use. The approximate cost of a circulation transaction would be:

$0.16 + $0.01 = $0.17

2 Minutes of Clerk's Time + Supplies = Total Cost

Information has now been gathered about the time an activity requires, as well as a rough approximation of the cost of that activity. It costs about $0.17 to circulate one book. Of course, this does not take into consideration overhead expenses like facility or utilities.

It can be very helpful to quantify these problems, as above, to better describe them. If each circulation presently takes two minutes and twenty-five circulations are normally done each hour, then that obviously doesn't leave much time for other work. This is much more descriptive than saying that you are very busy at circulation. Your funding sources will have a better understanding of your situation. Costing information usually strengthens your case for automation, as well as aiding in determining how much more you will actually be spending. More information about costing is covered in Appendix E.

If time cannot be found to cost activities completely, at least detail the average time spent on each. This will prove helpful when evaluating the success of your automated system.

GOAL

State the goal of the project. Remember it must be in support of the library's long range plan or the automation long range plan. It is usually one or two sentences and clearly defines the specific results of the project. For example:

> The goal of this project is to implement automated circulation and public access catalog systems to serve the Bridge Memorial Library.
>
> The goal of this project is to identify alternative circulation and public access catalog systems, compare them, and install the most viable system.

CONSTRAINTS

State any conditions under which the library must complete this project. Sometimes these constraints are placed upon the library by its funding authorities, its governing board, or its public. For example:

> The library must purchase a system which will run on the existing local area network.
>
> The library must provide a written report to the governing board after each phase of the project.

OUTLINE

Create an outline of the major phases in the project. Then each phase should detail the activities and steps necessary to complete it. This outline will change as the project progresses. As more information is gained, it should be reflected in the outline. For example, an outline for site preparation might look like this:

Site Preparation

- Select a site for the file server
- Select sites for workstations, both public and staff
- Prepare sites for file server and workstations
  - Identify equipment to be used at each location
  - Design space layout for each location
  - Install necessary electrical outlets for each location
  - Install cables from file server to each workstation or telephone lines for modem use
  - Initiate work for other construction, renovation or movement of equipment and furniture

SCHEDULE

By attaching completion dates to parts of the outline, a simple schedule can be created. Normally, dates are not assigned to minor parts of the project. For example:

Long Range Automation Plan	December 1993
Initial Budget	February 1994
Functional Checklist	March 1994
Vendor Demonstrations	July 1994
References	July 1994

Select Vendor	August 1994
Negotiate Contract	September 1994
Site Preparation	September 1994
Retrospective Conversion	September 1994
Install Hardware	October 1994
Install Software	October 1994
Train Staff	November 1994
Barcode Collection	December 1994
Load Patron Data	December 1994
Write Training Materials	December 1994
Implement System	January 1995

If desired, dates can be assigned to activities beneath each of these categories. Remember, this is not exhaustive. Your list may include other categories and dates.

Gantt charts are another scheduling tool. Instead of using completion dates, a Gantt chart graphically displays when activities begin, when they end, and other activities which are being accomplished at the same time. Particularly if you have simultaneous activities, a Gantt chart is very helpful.

BUDGET

There are two types of costs to consider in an automation project -- one-time costs and ongoing costs. Following are examples of each. Please do not consider this list exhaustive.

One-Time Costs

- Design Costs
    - *Consultant fees*
    - *Travel for site visits*
    - *Supplies*
    - *Copy services for documentation*
- Hardware Costs
    - *Workstations*
    - *Barcode Readers*
    - *Printers*
- Software Costs
    - *Library Automation software*
    - *Network software*
    - *Communications software*
- Site Preparation Costs
- Data Conversion Costs
- Staff Training Costs
- Furniture Costs
- Miscellaneous
    - *Shipping*
    - *Installation of equipment*

Ongoing Costs
- Salaries and Wages
  - *Administration of the system*
- Supplies
  - *Computer paper*
  - *Barcode labels*
  - *Printer ribbons*
  - *Disks*
- Communications Costs
- Hardware Maintenance
- Software Maintenance
- Miscellaneous
  - *Electricity*
  - *Training for new employees*
  - *Continuing training*

STAFFING

Include the names of the project staff, even if it is only your name. If outside help is available, state each of their names and their contribution to the project.

PUBLIC RELATIONS

Do not forget to publicize this project to your public as soon as approval has been given. Interim reports, published in the school or town newspaper help give your public a sense of expectancy, as well as giving you a reason to keep on schedule.

DATA CONVERSION

To use a software program, data or information has to be present. A word processing program like Microsoft Word is not very useful if a document, e.g., a letter or a report, is not also available. In other words, software is nothing without data. The same is true for library automation software. Without data, it is worthless.

What types of data are necessary in a library automation system? The same types of data used in manual library transactions are necessary in an automated system. To use the card catalog, information about the collection (e.g., author, title, subject) is needed. To circulate materials, both information about the patron and information about specific items in the collection are needed. However, to use this information in your automated system, it will have to be converted into a format a computer can manipulate. Transforming the information from a printed format to a machine-readable format is called "data conversion."

MACHINE-READABLE CATALOGING (MARC)

No discussion of data conversion is complete without an explanation of MARC. MARC is the structure libraries use for their bibliographic data. It is an accepted standard that is supported by the Library of Congress.

For this manual, MARC will be defined as the structure for bibliographic information, not the content. This is an important distinction and bears some discussion.

Using the catalog card as an example, the structure is approximately as follows.

Call Number	Main Entry.
	Title / by Author. - Place : Publisher, Year. Extent. Notes. ISBN.
	Tracings.

This structure states where the different types of information are placed on a catalog card. However, if the item was cataloged in two different libraries, the content of the two cards may look like the following examples.

590
CO

Cook, P. Lesley.

Effects of mergers : six studies / P. Lesley Cook. London : Allen & Unwin, 1958. 458 p. ; 22 cm.

I. Title.

590
CO

Cook, P. Lesley.

Effects of mergers : six studies / P. Lesley Cook with the collaboration of Ruth Cohen. London : Allen & Unwin, 1958. 458 p. ; 22 cm. - (Cambridge studies in industry).
Contents: The cement industry/ P. Lesley Cook - The calico printing industry / P. Lesley Cook - The soap industry / Ruth Cohen - The flat-glass industry / P. Lesley Cook - The motor industry / George Maxcy - The brewing industry / John Vaizey.

I. Title. 1. Cohen, Ruth. 2. Series.

The structure of both bibliographic records are the same; that is, the same type of information is in the same locations. However, the level of cataloging, or content, of the two are very different.

The same analogy can be used when dealing with MARC records. It is very important to have bibliographic data placed in the MARC format during the data conversion process. It is the standard and will greatly aid when upgrading to another library automation system, or combining the databases of more than one library for a union catalog.

The content is also very important. By analyzing the two previous catalog cards, it is easy to see that one has more information. In an automated system, this information can be searched and located by patrons. This increase in the number of ways an item can be located, or accessed, should increase the use of the library's existing collection. For more information on the content of a bibliographic record, please refer to the *Anglo-American Cataloging Rules*, 2nd edition, revised 1988, which can be loaned from the Texas State Library.

The MARC record is a structure which a computer can manipulate. Instead of knowing that the call number is always in the upper left hand corner, as for catalog cards, the MARC format attaches a three-digit number that corresponds to the call number. In this way, regardless of the location of the call number in the bibliographic record, the computer can locate it because it is attached to the "092 field."

For librarians, it is a matter of learning to locate information in different places. Below is an example of a simplified MARC record.

092	|a 590 |b Co
100	|a Cook, Lesley P.
245	|a Effects of mergers |b six studies / |c Lesley P. Cook with the collaboration of Ruth Cohen.
260	|a London : |b Allen & Unwin, |c 1958.
300	|a 458 p. : |c 22 cm.
440	|a Cambridge studies in industry.
505	|a Contents: The cement industry / P. Lesley Cook - The calico printing industry / P. Lesley Cook - The soap industry / Ruth Cohen - The flat-glass industry / P. Lesley Cook - The motor industry / George Maxcy - The brewing industry / John Vaizey.
700	|a Cohen, Ruth.

As you can see, the same information is contained in this MARC record as in the earlier catalog card. There are some unusual characters and the structure is probably unfamiliar, but with a few hints, the record will become very readable.

The delimiter character (|) divides each field into sub-fields. The letters following the delimiter character describe the type of information in that subfield. For example, the 260 field contains publishing information. The |a states the place of publication; the |b states the publisher's name; and the |c states the year of publication. Following are basic definitions for the fields and subfields used.

092	Local Dewey Call Number	
	|a	Classification Number
	|b	Cutter Number
100	Author	
245	Title Statement	
	|a	Title
	|b	Remainder of Title
	|c	Remainder of Title Page Transcription
260	Publishing Information	
	|a	Place of Publication
	|b	Publisher
	|c	Year of Publication
300	Physical Description	
	|a	Extent
	|c	Dimensions
440	Series Statement - Added Entry - Title	
505	Contents Note	
700	Added Entry - Personal Name	

These examples are simplified USMARC bibliographic formats. There are other USMARC formats, including a format for holdings information (location/call number/copy statements), and a format for authority information (e.g., "see" and "see also" references). Each format uses the same type of record structure, although the field numbers will have different meanings.

There are three basic types of data conversion: title conversion, item conversion, and patron conversion.

TITLE CONVERSION

The result of title conversion is a database of USMARC bibliographic records which include information such as authors, titles, ISBN, LCCN, call number, publishing information, physical description, series, notes, and subjects. In general, this conversion does not include the transfer of local holdings information to the USMARC record.

The way in which the conversion will be done will depend upon a number of items. The major item is to decide what will be used as the basis for the conversion. Ask yourself what your library uses as the authority regarding the ownership and location of material. Is the shelflist generally thought to be the most accurate? Then this will be the basis for your conversion. It is very important to use the most accurate information available. The phrase "garbage in, garbage out" applies. If the information placed in the system is inaccurate, then it will cause more problems than in a manual system because an automated system is much more powerful and provides much more access to information than a card catalog.

After deciding which data will be used as the basis of your automated system, read the following section that describes it. A more detailed manual on data conversion is available through the Texas State Library: *Data Conversion: A Fundamental Step Toward Library Automation.* A brief description of conversion options is listed in Appendix A. The information below will refer to these options. Remember that conversion is not limited to a single option. In many situations, more than one option may be used for different parts of the collection.

No Information Available

In this case, the information for the automated system should come from the materials themselves. Library staff will have to handle each item and enter information into some type of database. The type of information will depend upon the method chosen.

Online, Shared Cataloging Database

The library could become a member of a large database and use their bibliographic records as the basis of its own. The staff member would search the database and find a match for the material. Local information could then be added, the record edited, and saved to a disk for future use.

Batch, Shared Cataloging Database

The library could contract with a vendor to match LCCNs and/or ISBNs/ISSNs and retrieve a matching USMARC record. The staff member would create a list of LCCNs and/or ISBNs/ISSNs in a machine-readable form. A database program is preferred, but a spreadsheet or word processing program can be used. The library sends the disks to the conversion vendor, which uses a computer program to retrieve the USMARC records, which are then copied for the library.

If the library would like the vendor to add other information to the record, they could add this information to the list of LCCNs/ISBNs/ISSNs. The same type of information must, however, always appear in the same place so the vendor can find it easily and transfer it.

CD-ROM Bibliographic Database

A CD-ROM database could be leased or purchased for conversion. The staff member would search the database to find a record that matches the material in hand. Local information could then be added, the record then edited, and saved to a disk for future use.

Original Local Input

After purchasing a USMARC program or after purchasing the automated library system, the materials could be originally cataloged by staff members.

Shelflist or Main Entry Card

In this case, the data should come from either the shelflist card or the main entry card if it has complete bibliographic information, including tracings.

Online, Shared Cataloging Database

Using the shelflist or main entry card, a staff member can use an online database to match bibliographic records to the material. Local information could then be added, the record then edited and saved to a disk for future use.

Batch, Shared Cataloging Database

Using the shelflist or main entry card, a staff member can create a database of LCCNs and/or ISBNs/ISSNs. These disks can be sent to a vendor who will use a computer program to match these unique numbers to a USMARC record. The records are copied to disks or magnetic tapes and sent to the library.

If the library would like the vendor to add other information to the record, they could add this information to the list of LCCNs/ISBNs/ISSNs. The same type of information must, however, always appear in the same place so the vendor can find it easily and transfer it.

CD-ROM Bibliographic Database

Using the shelflist or main entry card, a staff member can use a CD-ROM database attached to a computer to match bibliographic records. Local information could then be added, the record edited, and saved to a disk for future use.

Contracted, Customized Conversion

The shelflist or main entry card can be sent to the conversion vendor with specifications. They will match the cards to a USMARC record and input any local information desired. The resulting USMARC records are copied to disks or magnetic tape.

Original Local Input

After purchasing a USMARC program or after purchasing the automated library system, the materials could be originally cataloged by staff members.

Machine-Readable Bibliographic Records

If a previous system or an in-house system was developed, the data can usually be exported to disks or magnetic tapes. The record layout, or the structure of the record, will be necessary in order to convert the data using this information.

Batch, Shared Cataloging Database

If available, a computer programmer familiar with the system can create a disk or magnetic tape of the LCCNs and/or ISBNs/ISSNs. The disks or tapes can be sent to the vendors and this information can be used to retrieve matching USMARC records.

If the library would like the vendor to add other information to the record, the programmer could add this information to the list of LCCNs/ISBNs/ISSNs. The same type of information must, however, always appear in the same place so the vendor can find it easily and transfer it.

Contracted, Customized Conversion

The entire database can be given to a vendor in machine-readable form. As long as they have the record layout and know where specific pieces of information are placed, they can match USMARC records and move information from the old database to the USMARC database. For example, if information about the original purchase has been kept in certain places in the old database, the vendor can find that information and transfer it to specific fields and subfields in the USMARC record. The library, however, must tell the vendor where the pertinent data is to be found and in which fields and subfields they want it placed.

ITEM CONVERSION

The title conversion should result in a single USMARC record for each title the library owns. This bibliographic record will contain important information about the title, but may not contain local information such as the number of copies or volumes. The item conversion specifically addresses the "items" in your collection, not the "titles." For example, a library may own three copies of *Old Yeller*. After title conversion, they would receive one USMARC bibliographic record for the title. After item conversion, this bibliographic record should show that the library owns three copies, or items for this title.

Item conversion can be done after the title conversion. Many libraries have a single conversion vendor convert both types of information at the same time. Some libraries prefer to convert "on-the-fly" or as the materials circulate.

Each item in the library will receive a unique number. This number is called a barcode number. In order to circulate materials, the library automated system will require a barcode number. There are two major parts to the item conversion process: assigning barcode numbers and attaching the barcode label to the materials. This can be done using one of two types of barcodes: either smart or dumb barcode labels.

Dumb Barcodes

Assigning Barcode Numbers

Dumb barcode labels are normally used when an outside conversion vendor has not been used for item conversion. They are not associated with any particular items and the staff must electronically link the barcode number to the bibliographic information in the computer database. In this scenario, the database has been loaded into the automated library system and the dumb barcode labels have been purchased from a barcode vendor, a sample of which is below:

TEXAS STATE LIBRARY

3 6237 00114058 7

Attaching the Barcode Labels

The collection can be barcoded at one time by attaching the dumb barcode labels to each item, searching the item in the system, and scanning the barcode symbol into each item record.

The collection can also be barcoded as it circulates by barcoding "on-the-fly." The library staff can attach a dumb barcode label to each item in the library. Then, as materials are circulated, the circulation clerk scans the barcode symbol. If the symbol is not recognized, the clerk locates the item by searching, scans the barcode symbol into the item record, and resumes the circulation process.

Advantages of Dumb Barcode Labels

1) There are cost savings in producing dumb barcode labels instead of smart barcode labels.

2) The library can control the schedule for labeling particular sections of the library and in handling problems that arise.

3) Extra work preparing detailed specifications for smart barcode label production is avoided.

Disadvantages of Dumb Barcode Labels

1) Every item in the collection must be linked to the correct bibliographic record. After labeling, this can be accomplished at a rate of approximately 40 items per hour.

2) The overall library data entry rate will be limited to the number of available data entry workstations and operators.

3) Physical labor is necessary for transferring the books to carts, transferring them to a workstation for data entry, and transferring them back to the shelves.

4) Extra time is needed during the initial circulation process if barcoding "on-the-fly."

After the initial item conversion, libraries normally use dumb barcode labels for ongoing processing. These labels are attached and scanned into the item record during the cataloging process.

Smart Barcodes

Assigning Barcode Numbers

If the title conversion has been sent to a vendor for contracted, customized conversion, or if you have a USMARC machine-readable database that can be sent to a vendor, the barcode numbers can be created for you in the field or subfield you prefer. Most vendors can also create "smart" barcode labels from this information. A sample of a smart barcode label follows.

TEXAS STATE LIBRARY
020.3 En19 v.3 LSC
Encyclopedia of library and information
3 6237 00008257 4

The smart barcode label consists of the barcode number, 36237000182574, the barcode symbol, which corresponds to the vertical lines of varying width, and bibliographic information about the item. This information usually includes the location, the call number, and parts of the title and/or author. The object of this bibliographic information is to be able to determine to which item a specific smart barcode label belongs without searching it on an automated library system. Since the barcode numbers have already been placed in the item record, it is of utmost importance to attach them to the correct item.

Attaching the Barcode Labels

Since there is enough bibliographic information on the smart barcode label to determine to which item it belongs, barcoding the collection is made easier. The barcode labels are usually sorted first by location, then by call number, then by either author or title. The barcode label must match the item exactly before it is placed on the material.

When charging an item for the first time, the circulation clerk uses a light pen or scanner to "read" the barcode symbol, not the barcode number. The computer "reads" the symbol and finds the item which has been linked to it (by the conversion vendor). The information is then displayed to the clerk and the circulation process continues.

Advantages of Smart Barcode Labels

1) The vendor usually has extensive experience in this process, and therefore is able to create the detailed functional specifications for smart barcode label production.

2) The vendor is responsible if any problems arise.

3) The library can control the schedule for labeling particular sections of the library and in handling problems that arise.

4) The physical labor of transferring the books to carts, transferring them to a workstation for data entry, and transferring them back to the shelves is avoided.

5) Much of the time involved in entering barcode numbers by hand is avoided.

Disadvantages of Smart Barcode Labels

1) Smart barcode labels are more expensive than dumb barcode labels.

2) Preparing specifications for the creation of item information in the USMARC record and the creation of the smart barcode labels require time on the library's part.

PATRON CONVERSION

The third type of conversion is patron conversion. Patron information must also be in machine-readable form in order to circulate materials. This information can include patron name, address(es), phone number(s), social security number, patron category, identification number, or other local information decided upon by the library staff. In general, there are two methods for transferring this type of information into the automated library system. The method chosen depends upon whether the information is already in a machine-readable format or not.

Machine-Readable Format

If the information has been entered into a computer, it is likely a program could be written to transfer specific information to the automated library system.

In academic situations, normally the registrar's office maintains a database of current students. This will include much more information than the library will need, but specific fields can be extracted for use in the library's system.

In some libraries, patron information has been transferred to an in-house software program, such as a database, a spreadsheet, or a word processor. A program could also be written to transfer this information to the library's system.

Manual Format

If there is no information in a machine-readable format, then the information will be entered into the system by the library staff. This may be preferable even for some who have patron information in a computer. If the information is dated or incorrect, this may be a good time to clean the slate and start over. There are a number of options for entering this information.

Re-register Patrons

As patrons use the library, re-register them and enter the information into the system either during the circulation process, or in batches during the slow times of the day. If new patron cards are purchased, this would be a good time to distribute them. If existing cards will be used, the barcode label could be attached at this time.

Existing Registration Cards

Patron information can be entered into the system from the existing registration cards. This could be done as a special project or for a few hours each day until finished. If new patron cards are purchased, they could be distributed during the patron's first visit after automation. If existing cards will be used, the barcode label could be attached at this time.

Below is a comparison of the utility of purchasing new library patron cards and using the existing patron cards.

Use of Existing Library Cards

Advantages

1) Permits the use of the currently-used cards and will not waste remaining supplies.
2) Allows the patrons to use the same library cards throughout the transition to the automated system.
3) Clearly indicates those patrons who have been re-registered; the label has already been attached to the card.

Disadvantages

1) Old cards are retained; newer cards are more modern, attractive, and usually sturdier.
2) Barcode label can become mutilated or removed from patron card.

Use of New Library Cards

Advantages

1) Good public relations and newer image projected with new card.
2) Brings the "change" to the patron's attention.
3) Clearly indicates those patrons who have been re-registered; some will have the old card, some the new.
4) Usually more durable than existing cards.
5) Credit card or key-chain size may help patrons in remembering to carry their card.

Disadvantages

1) New library cards are more expensive.

PROCUREMENT

When purchasing a mini-computer based system, libraries often take advantage of the Request for Proposal (RFP) process. This includes sending out a listing of functional specifications that are required by the library and having the vendors comment on their ability to attain those and any other requested facilities or services. However, in the case of the procurement of a small system, vendors are often less interested in answering involved RFPs for the amount of financial return on their investment with the sale of a small system. Therefore, in a small procurement, you may be faced with the prospect of attempting to make your decision without the aid of an established procedure.

You can consider the steps discussed in this section as a possible alternative to the RFP process. While it still involves a great deal of work on the part of the library, it offers a chance to compare systems somewhat objectively, as well as lessening the amount of time the vendor will have to spend on your procurement. Both of these factors make this procedure a realistic alternative that should assist you in your choice of a system that will fit your local needs.

As we discussed in the section on planning, embarking on an automation project usually points out how little you know about automation. After finishing the planning process, you will know much more about automation and probably a little more about your own organization. You will need that knowledge now, as you begin to construct your functional specifications list. As you think about the functionality you will need in a system, keep in mind the important, but often overlooked cornerstone rule of automating your library:

> **Automation does not necessarily mean transferring your manual processes and procedures directly into machine-readable data files.**

While studying the challenges faced by your library, automation was considered a way to meet these needs. It may also be that those procedures should be changed in light of automation. Perhaps there are procedures that you follow simply because you have been unable to handle them in another way. For instance, some experts have suggested lengthening loan periods in small libraries to lessen the number of overdue materials and other associated tasks. Now that you are automating, you will not be under these same constraints and you may decide to change some of your policies. Don't get caught doing things just because "they've always been done this way." One major side-benefit of automation is that it is a perfect time to change the policies or procedures of the library. Your patrons will be getting used to so many changes, they are usually able to handle one or two more.

INFORMAL DEMONSTRATIONS

In your automation plan, you discussed the functional modules that interested you (e.g., circulation, public access catalog). It is now necessary to be more specific concerning functionality. At this point, this procurement will be very much like the more involved one inherent in a larger system. In order to create the functional specifications, you should be familiar with the operation of an automated system. If you have never seen an automated system, or if you have never looked closely at one, it is important to do this before you begin to construct these specifications. The easiest way to do this is by attending exhibits at library conventions. At the annual Texas Library Association conference and both meetings of the American Library Association, there are numerous booths dedicated to automated systems. These offer a perfect opportunity for you to get a quick and varied introduction to the vast world of automation.

At these exhibits, visit the vendors that offer automated systems and watch a demonstration. Think of search terms ahead of time. Enter the searches and examine the results. Watch the way searching is done rather than the actual number of "hits." Normally vendors use only a small sample of records at a demonstration, so response time (the time you wait for an answer) is not necessarily indicative of what it would be like in your library. Check out a book. Imagine using this procedure at your library. Would it fit in with the way you do things? Or, do you like the changes you would have to make to make it fit? Once you have seen a few of these systems, you will start knowing what to expect.

Keep in mind that every vendor would like to be either the first or last system you see because they would like to show their system in the best possible light. They would like to be first because you will be extremely impressed by the first system you see. They would like to be last because you will best remember them.

Try to focus more on the system than on the personality of the salesperson. While it is true that you would like to buy from a company that has nice employees to help you, remember:

1. **People change jobs.**
2. **Salespeople are probably not the people you go to with problems of system operation.**
3. **Salespeople make their living being personable.**

Therefore, try to keep an open mind about systems, note the order in which you viewed demonstrations, make a note if the salesperson was sweeter than aspartame and understand related impressions.

SITE VISITS

Start visiting local automated libraries. If you or one of your staff members goes on a trip, visit libraries along the way. This is a good way to begin understanding how a system fits into other libraries and into yours.

FUNCTIONAL SPECIFICATIONS

In order to purchase a system from the variety of those available, it is important to be able to evaluate the systems with regard to your local situation. This is an area that is often misunderstood. If you are buying a stereo, it is easy to consult a guide such as *Consumer Reports* to find the best buy. Many times, librarians call consultants to ask for a recommendation on which library automation software package is the "best." They are usually very disappointed to hear, "it depends." However, in this case, it really does depend on your local situation. You have to consider how you conduct your business now to determine if the functions described are adequate for you. For example, if you work in a school library where you have to report delinquent students to the office every semester, but only need to report delinquent teachers annually, you would probably prefer to have delinquency lists that can be generated by patron category. In a public library, if you calculate the cost of a lost book using the book's actual cost plus a processing fee, you would probably want a system that would allow you to manually add charges at the desk or one that would automatically add a fixed processing fee. In an academic library, you might want a system that can automatically load patron records from the college computer into your system.

Before looking at some specifications, a warning - be wary of features which are almost ready to be marketed. They may never be marketed. If a necessary feature is "almost ready," look for another vendor.

Let's take a look at a few functional specifications (in bold-faced type) and discuss why they may or may not be of interest in your local situation.

> **The system should allow easy access between various functions in the circulation control system with a minimum of keystrokes. An operator should not have to "back out" of a function and re-enter another related one.**
>
> Some systems are set up on a "tree"-like structure in that the entry to any subsystem (such as charge or discharge) has to be from the top level. Therefore, if you are in the charge module of the system and someone wants to discharge a book or pay a fine before they charge some other books, you have to exit the charge program and go into the other subsystem in order to complete the transaction. Other programs provide for more "lateral" movements within the system. This is a local decision. You may not mind exiting one program in order to take care of other business or you may feel that if you have to consciously make that change there will be less chance of confusion.
>
> **The patron data entry process should be easy, permit the charging of materials immediately upon registration, and store all of the necessary patron information for your library operations. Some specific items to include would be:**
>
>> **sufficient numbers of patron categories, with different, automatically assigned borrowing privileges and statistical tracking for each group**
>>
>> **branch registration locations**

The definition of "sufficient" numbers of patron categories is a typical question that must be determined by analyzing your patrons. Patron categories are used for statistical counts as well as for borrowing privileges. For example, if you want to allow some patrons to charge more books than others, you have to determine the different groups of borrowers that you have and the privileges for each. Even if you have determined that everyone will have the same borrowing privileges, you may want to be able to collect information about patrons that you see as different "groups." For example, you may want to count young adult or juvenile circulations as separate from the total patron universe. Unless each is a separate category, you will not be able to distinguish them for report counts. As mentioned earlier, automation presents an opportunity to modify procedures or policies. Perhaps you have always wanted to have a shorter borrowing period for best sellers than other books, but it was too much trouble with a manual system. Now is the time to consider policies you have long wanted to change and include those needs in the functional specifications lists you are considering for your system.

If you don't have branch locations, bookmobiles or any other "satellite" stations, any mention of these in "canned" functional specifications lists would not be applicable.

Notice production should contain the following features:

> **production/printing/reprinting of notices in zip code order**
>
> **produced in a format suitable for data mailer forms use (these forms eliminate the need for envelope stuffing)**

If you are not interested in the use of data mailer forms, this function would not be important to you. Though data mailers are a timesaving device in most situations, they are more expensive than plain paper.

The system must provide access, by call number, to information contained in the shelflist for both patron and library staff use.

Not all systems provide call number access. If this is not important to you, then it would not be included in your functional specifications list of mandatory items. This type of listing can be very helpful when you stop keeping a paper shelflist, as well as providing the capability of "browsing the shelves" by displaying material that would shelve alongside each other.

System should provide for keyword searching of fields to be defined by the library (e.g., author, title, subject and notes fields).

Searching by keyword retrieves records that contain the requested word or phrase. Depending on the system, a keyword search may only scan the title field in a record, or it may look through all fields for the term noted. It is helpful to know how a keyword search will be conducted in the system you are examining. At times, you will retrieve records that do not seem to contain your search term at all because the brief record does not display them. However, if you knew which fields were being searched, you would realize that your term is actually contained in a field that is not displayed.

System should provide a stop word list which the library can customize.

Certain terms retrieve worthless results when searched. Some of these terms may be "since," "but," "if," "conference," or "university." For example, when searching "Texas" in the database at the Texas State Library, the number of hits will be enormous, and pretty much useless. This list of terms should be customizable by the library. The library staff should decide which, if any, terms should be stop words.

System should provide for Boolean searching of the database using "AND, OR, NOT" expressions.

Boolean searching is used to narrow or broaden a search. This facility uses "AND, OR, NOT" expressions to limit or expand searches.

Two terms that are connected by "AND" result in a narrow hit report. By using "AND," the patron is asking that both terms be included in the bibliographic record. For example:

cats AND kittens

This search will retrieve all bibliographic records which contain BOTH "cats" and "kittens" somewhere in the record. The terms do not have to be adjacent, or in the same field; they just have to be present.

Two terms that are connected by "OR" result in a much expanded hit report. By using "OR," the patron is asking that either one or the other terms be included in the bibliographic record. For example:

dogs OR cats

This search will retrieve all bibliographic records which contain either "dogs" or "cats" somewhere in the record.

Two terms that are connected by "NOT" should be used cautiously because it may result in false hits and may not display references desired. For example:

investments NOT stocks

This search will retrieve all bibliographic records which contain the term "investments" and which do not contain the term "stocks." The patron probably would like information on all types of investments except stocks. However, they will probably retrieve false hits (a book entitled *An Investment in Love*) and not retrieve relevant citations (a book detailing the many types of investments, which includes a section on stocks).

These expressions can also be used in the same search. For example:

(nutrition AND cooking) NOT microwave

This search will retrieve all bibliographic records which contain BOTH the terms "nutrition" and "cooking" but not the term "microwave." The patron probably would like information on nutritious cooking, but doesn't own a microwave.

System should allow the library to choose the Boolean expression implied in search strategies.

A patron enters a search such as:

apple juice

The system will either search the two terms as a phrase, and look for "apple juice" in the bibliographic record in that exact order, or it will assume this is a Boolean search. If it assumes a Boolean search, then it will use a default Boolean expression to create the search results.

If the system assumes "AND," then the system will retrieve bibliographic records which include the terms "apple" and "juice," but not necessarily together. If the system assumes "OR," then the system will retrieve bibliographic records which include either the term "apple" or the term "juice," but not both.

In some systems, it is possible to use an adjacency expression. This requires the terms to be next to each other. If the adjacency operator were the default in this case, the patron would probably retrieve the information desired.

The library must be able to specify a ceiling of postings for any search expression without the need or intervention of a programmer.

It is helpful to be able to limit the number of "hits" that will be reported for any given search expression. This is to keep a search like "Texas" from generating an overwhelming number of hits. Patrons often find a search resulting in "too many" hits to be intimidating. With a reduced number of postings given, patrons will usually get to the correct area of the collection, even though they do not receive all listings. Many systems offer an alternative in which the system informs the user that an excessive number of hits have been located, and asks the user to narrow or qualify their search. How many is "too many" or "excessive" is often left to local discretion and it is usually preferable that it be easy to change this ceiling.

Authorized operators must be able to override the posting ceiling block.

As soon as you determine a ceiling, someone will come in with a perfectly legitimate reason to want to see "everything" on a subject. So it is helpful to have the ability to override posting ceilings. Library staff may find that they want a bibliography of everything available in the library on a certain topic and this number is greater than the posting limit. Without this facility, it would be impossible unless the ceiling is changed each time.

System should provide for proximity operators when searching the database.

If you would like the ability to specify search words within a certain proximity of each other, this facility is helpful. This is desirable when the search term is not always entered in the same way or when you are interested in two separate terms linked by some combination of articles or other words.

The library must be able to specify a ceiling of pages or records printed for any search session.

While many libraries have printers attached to their public access catalogs, many also determine a ceiling of postings that can be printed at one time in order to control massive printing sprees. If you have the public access catalogs located near the reference desk or another staffed area, chances are good a staff member will hear the continuous printing and come over to check the situation. If you locate computers throughout the building or if you have a very small staff, this could be a facility in which you are interested.

As you can see from the few examples above, the creation of a local functional expectations list is a customization process. You should not take "canned" lists and expect them to fit perfectly in your local situation. It takes time to determine your local needs, compare them to any sample list and edit the list appropriately. In addition, there are probably capabilities that are not noted in any one canned list that you would like for your situation. It is only by considering your local situation, reading any available articles on the subject of choosing or evaluating a local system and carefully editing any existing list, that you can achieve a set of functional specifications that accurately reflect your local situation. A sample list is in Appendix C.

Next, it would be helpful for you to carefully look over your completed list and rank each specification as "essential" (1), "desirable" (2), or "helpful but not necessary" (3). If a system could not perform an essential function, it would not be considered an option for purchase. Ranking these functions and noting the ability of the systems to comply with them can help to make your ranking of system functionality more objective.

Since you will be using the functional specifications list during vendor demonstrations, you should create it in a "checklist" format that will allow you to make notes concerning system operation. You can either modify the list itself or use another form with the functional specifications. A sample of one such form follows.

PRODUCT DEMONSTRATION CHECKLIST

Fill in the date of the demonstration, the vendor name, the product name, and the functional module being demonstrated. Note if the system was able to meet that criteria or if it was handled differently. Use the NOTES column for information which you want to remember at a later date. Sometimes it is helpful to insert a phrase next to the rankings to remind the staff of the functional specification being demonstrated. Otherwise, a separate sheet with the specifications, in rank order, will be necessary.

Date of Demonstration: ____________________ Vendor Name: ______________________
Functional Module: ______________________ Product Name: ______________________

Rank	Yes	No	Other	NOTES
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
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FORMAL DEMONSTRATIONS

Once you have created your checklist, it is time for the "formal demonstration" process. Call vendors to present formal demonstrations at your library. If that is not possible, schedule meetings with different vendors at TLA or ALA. Formal demonstrations involve showing the system to you alone for a certain period of time. You will need a specialized demonstration to assure that you address all functional specifications in which you are interested. They may ask to see your list of functional specifications and if they do, send it to them. What you are looking for should not be a secret, and, if by knowing what you expect, they do a more specific demonstration for you, the result will be to your benefit and the vendor's.

After you have seen demonstrations of the systems you are interested in, "score" the functionality of the systems to determine the ones that best meet your functional needs. Having ranked the different functional specifications becomes important at this point. If you have already assigned rankings to the specifications, looking over the results is much easier.

"BALLPARK" PRICE ESTIMATES

If you have not yet done so, ask for a price list for the system. This will help you determine if you will be able to afford their system. Talk to the vendors about your budget and discuss approximate costs. However, I would not discuss specific prices at this time because it might prematurely place too much emphasis on that aspect of the procurement. There will be plenty of time to think about price. It may be that you have already had to construct a budget estimate when writing your automation plan, so this step may not be necessary.

REFERENCES

Ask for names of references (present users of the system) from those vendors in which you are interested. It is best to find references from libraries that are close to you in size and type. For example, if you are a director of a library of 30,000 titles, talking to the automation coordinator at the New York Public Library may not be very helpful. You could get some interesting information, but the drastic difference in scope, size and type would lessen its applicability. The vendor may not have a site that is exactly like yours. At this point, it is up to you to decide if you are willing to risk being the first of your type or size. While the general rule of thumb is "never be first," sometimes certain situations give you reasons to change your mind. Looking at the vendor's track record with existing installations is a good indicator of how they will follow through for you. That, along with stringent contractual assurances, may be enough to make you feel comfortable being the first.

Next, construct a list of questions to ask these people about their system. This will help standardize the information you receive. Without such a list, your call could end up being one long discussion of how that library barcoded their collection. While this might be interesting information, it will probably not be very helpful at this point. First time system buyers are usually very interested in how a system works and the features it offers. However, take it from repeat purchasers: the most "feature-filled" system in the world is no good if it doesn't work. So, look at functionality, but ask everyone about the responsiveness of the vendor and the system reliability. Though there are probably many other questions you have, remember these as well:

How knowledgeable are the vendor's personnel?
Do they understand libraries?
When you call for help, is it difficult to reach someone who can help you?
How quickly are your problems normally resolved?
Did the vendor accurately estimate the time spent in system implementation?

How would you rate the documentation provided by the vendor?
How would you rate the training offered by the vendor?
How are problems resolved with the hardware?
How are software problems resolved?
Is there an active users group?

Have you been down since you've been online? Can you estimate time per month?
If the system goes down through no fault of the library, what does the vendor do about it?
Do you have a contract with the vendor?
Do you have a maintenance agreement with the vendor?

TOP THREE VENDORS

Once you have looked carefully at the systems and determined the "ballpark" prices of the system, determine the top three vendors. Do not rank these top three vendors as 1, 2, or 3 at this point; in fact, if you really like four vendors, you can specify those at this time. It will take a bit more time, but it is acceptable to keep the field larger if you prefer. You are not at the point of sending out a purchase order to vendor number 1.

SITE VISITS

If possible, it is very helpful to see all "finalist" systems in operation. While this may involve some travel, if you are able to find libraries near you to visit, you will find it extremely helpful. This is also a good time to talk directly to librarians and ask any questions you might have missed during the reference interviews. Also, take a look at any material the library might have developed to aid them in using the system. Was the documentation provided by the vendor so helpful that local user aids were unnecessary? How about the time required to "back-up" the system? How does it compare to vendor estimates? What about ongoing expenses or charges that the vendor didn't mention?

CONTRACT CLAUSE DISCUSSION

If possible, discuss contract terms with the "short list" of vendors you have identified. I say "if possible" because some small systems are purchased without any contract at all. This discussion would include determining the willingness of the vendor to agree to a contract containing assurances you consider important. It would be useful to list these items of importance and have the vendor reply in writing. If you do have a chance to lock the vendor into some basic items in the contract, it is recommended that you do so. If you determine that you will be able to negotiate a contract with your vendor, I would suggest that you look closely at *Preparing Contracts and Negotiating with Library Automation Vendors* by Robert Walton, which is available through the Texas State Library. Though the topic is dealt with much more completely in the publication mentioned, the following are some items to look for:

Functional Performance Examination
Does the system do what they said it would?

Reliability Examination
Does the system go "down" often?

Data Load Examination
Can the system accept your records in the form they said it would?

Full Load Response Time Examination
Once everything is loaded, does the system respond as quickly as they said it would?

Storage Capacity Examination
Can the system they suggested hold all the information you had to load?

Incorporation by Reference
Include all functional specifications, information, and assurances ever given by the vendor to the library in the contract, thereby making them binding.

Listing of equipment, software, supplies, and services
List all of the above with associated prices.

Identification of parties to the agreement
Specify name of your institution and the vendor.

Applicable and governing law
Texas state law should be the governing law of the contract, not the law of vendor's state.

Shipping of Equipment
In order to limit risk to library, vendor owns all equipment until installed.

Escrow of Library System Software
Can you get to the source code if the vendor goes out of business?

Computer Hardware Expansion Responsibility
If the vendor has told you what hardware to purchase, and after installation it is insufficient for your needs, the vendor should pay to upgrade the hardware so that it can do what they told you it would. You should acquire ownership of the equipment.

Software Warranty
The software will do what they said it would.

Final Acceptance of the System
System will be finally accepted after all tests are passed.

Publicity
The vendor cannot use your name in promotional material unless you give your express written consent.

In general, your aim in contract negotiation is to equalize the risk between you and the vendor as much as possible.

Before final payment to the vendor, the system must be evaluated to determine if it meets the requirements stated in the RFP or bid document. In many cases, a percentage of payment is tied to the successful passage of the acceptance tests. Each of the following tests evaluate a specific aspect of the system. Final acceptance and payment should not be given until the vendor(s) have passed each aspect stated.

Typically, microcomputer-based vendors will not agree to the following acceptance tests, except perhaps the Functional Competence Acceptance Test and the Database Load Acceptance Test. This refusal is appropriate, as the vendor sometimes has no control over the hardware upon which the library chooses to run the software.

Hardware Quality Acceptance Test

This test would be inapplicable in situations in which a library purchased a turn-key system, a mini-computer based system, or in which a library purchased the hardware from a different vendor than the software. The point of this test is to be sure the hardware purchased is sufficient to implement the software successfully. This is a 24-hour hardware performance test in which all hardware components are subjected to the manufacturer's diagnostic test procedures. It is also possible to have the vendor sign an agreement stating that the hardware is sufficient for its stated purposes. In this case, the RFP or bid document stating the specifications would become an attachment. If the hardware did not perform to the specifications, the vendor should upgrade it, at no expense to the library, until it is sufficient.

Database Load Acceptance Test

The vendor is demonstrating that a certain number of the library's bibliographic records can be loaded and indexed correctly by the system, accepting and transferring specific data elements to the correct fields in the vendor's records. Library staff members need to understand the bibliographic record which will be loaded into the system, the structure of the vendor's records, and what the conversion program will change or modify, if any, when transferring information from one record to the other.

Functional Competence Acceptance Test

The purpose of this test is to be sure the system can perform all functions listed in the RFP, bid document, or system manuals. This should only be done after the total system has been installed and is ready for use. Library staff should be able to perform each function listed in order to pass this test.

Storage Capacity Acceptance Test

This test is performed to assure the library that the hardware has enough "space" to load and manipulate the number of records the library currently owns, as well as the future number approximated by the library in the RFP or bid document. This is an ongoing examination which requires the system to be able to store a specified number of titles, items, and patrons. Should the system ever prove incapable of doing so, the vendor is obligated to provide all system components to accomplish this, at no cost to the library.

Full-Load Response Time Acceptance Test

This test is conducted to determine if the system can maintain its effectiveness under peak-load conditions with an acceptable response time. It measures the time required to complete typical transactions. Acceptable response times for specific functions should be specified before the test. This type of test should be carefully planned. If the system should prove incapable of meeting the stated response time, the vendor is obligated to provide all system components to correct this, at no cost to the library.

System Reliability Acceptance Test

This test determines if the system can operate at a specific level for a stated period of time. This is also referred to as the "Downtime (Uptime) Acceptance Test." Logs are kept of the amount of time the computer is down. After the stated period, the amount of downtime is divided by the number of hours the library was open. For example, if the library was down for 6 hours during a time when the library was open for a total of 600 hours, then the downtime would be:

$$\frac{6\text{ hrs}}{600\text{ hrs}} = 1\%\text{ downtime}$$

Stated another way, the system had a 99% uptime. Try to use at least a sixty day time span for this test. The system should have at least a 98% uptime.

SPECIFIC PRICING

Once you have discussed contractual issues, request specific price information from the vendor. This should detail the exact system in which you are interested, including the specific software modules.

PURCHASE SYSTEM

With the information you have gathered at this point, you know how the vendors stack up functionally (from demonstrations), in the areas of support, training (from references and contractual reservations), price and operation (from site visits). Now, follow the requirements of your local institution to actually purchase the system. Some areas require an "Invitation to Bid" document, while others will approve a simple purchase order. If you need to list specifications, you have the list of functional specifications and contract requirements that you have created. You can also issue a purchase order for a system that fulfills your requirements for the least cost.

Following this procedure can give you the peace of mind that comes from knowing that you have done your best to acquire a system that meets your needs. The planning and procurement phase is over. Now all you have to do is get it to work.

SITE PREPARATION CONCERNS

Site preparation specifications are typically supplied by the library automation vendor. If they are not, you have another area of potential difficulty with your vendor, as they can blame system problems on static electricity and substandard power. Some vendors will travel to your library to assess the site themselves. The resulting site specification document, stating what the library will need in order to implement the system successfully, should be made part of the RFP or bid document.

If the vendor supplies you with such specifications, please follow them carefully. This will not only help to assure proper system operation, but will also place you in a better position if there are unexplained problems with the system.

Although this is not common with microcomputer system vendors, try to obtain a written commitment from the vendor. If there are additional problems related to site preparation after you have complied, then the vendor should fix them at their expense. While you may not be able to obtain a written guarantee, at least you will have an understanding of the anticipated relationship that you will have with the vendor. This will set the proper business climate for you to request proper support. You may, during your evaluation process, discuss this matter with the prospective vendors, and seriously consider rejecting a vendor that seems uncooperative in this regard.

Although not all of the following specifications are applicable to every work site, this is a list of the items that you may wish to consider for each workstation location. Please be sure to discuss these with your vendor, and with other libraries which have already been using the vendor's system, in order to determine which of these are appropriate for you.

Independently Grounded Dedicated Electrical Circuits, 30 Amps

Microcomputers are finicky devices that generally prefer "clean" electrical power. This means that the electricity that supplies the workstation must be constant. The power must not only be present, but also must be unvarying in voltage levels and be without electrical noise or interference. To accomplish this goal, the library typically would have an electrician install independently-grounded dedicated 110 volt electrical circuits, which are usually 20 or 30 amps. Your electrician knows exactly what these are. Because the installation costs vary greatly, even in the same locale, several estimates are advisable.

Independently-grounded means that the third wire in the outlet has its own, separate connection to the earth. A ground permits a place for unanticipated excess electricity to be bled away from the electrical components plugged into the electrical circuit, and thereby helps protect the computer and the computer operator. An independent ground isolates the computer from the excess electricity that might be bled away from other electrical equipment in the library, as typically they share a single ground wire.

The vendor should install four-plex outlets (i.e., four plugs) for these circuits, and give the cover plates distinctive colors. This will remind people that these outlets are for computer use only. Instituting a strong library operational policy to this effect will also be helpful.

Some of the worst types of electrical troublemakers for computers include any devices that create heat (space heaters, hair driers), radio wave emitters (security systems, microwave ovens), electrical motors (they emit radio noise), and photocopiers. Please carefully consider any plans to place such objects within a few feet of your microcomputer, and strongly advise others against plugging such devices into the same electrical circuits.

Telephone Line, Analog/Telephone Line, Digital

An analog telephone line permits the transmission of tones. This means that voice or data (via a modem) can be communicated. Analog lines come in two quality levels: voice grade and data grade, based on the level of static and noise that the line contains. A voice grade line is the typical telephone line that you purchase from the telephone company for conversations. These lines are of sufficient quality for short data transmissions, but sometimes their static can distort or corrupt the data. Data grade analog lines are not used for conversations at all; rather, they are dedicated and constantly connected for data communications.

At least one analog voice grade line should be available at your file server or main computer so that you can look at the screen and talk with either patrons or your system vendor. Many vendors now require a dial-in access line for maintenance, upgrading, and troubleshooting your system. You may also want another such line for dial-in access for your patrons. You will probably not use data grade lines unless you have a workstation in another building that you would want constantly connected to your main computer.

A digital telephone line is a special, high-quality line (99.5% uptime typically guaranteed) which cannot conduct tones or voice at all--only digital data. These are sometimes called DDS lines (for digital data service). These are suitable only for dedicated communication between digital devices like terminals and computers, and are used when data accuracy, communications speed, and reliability are necessary. DDS lines are often more expensive than analog lines, but in larger cities often the opposite is true.

Data Cabling

Except for your main computer, all workstations will require that you install data cable that connects every workstation with the computer. Because the signal weakens with distance, the length of a connecting cable cannot normally exceed 700 feet. Typically the installers start at the workstation location with the spool of cable and, holding onto one end of the cable, they climb and crawl, pulling the cable off the spool as they work their way back to the main computer. This is why cable installation is called "pulling" cable. Because it is almost as easy for the installer to crawl back with more than one cable in hand, it is prudent to consider pulling additional cables, either for spares or for future growth.

The specifics of data cable installation can be complex. Please be sure that you follow the vendor site specifications, as well as local electrical codes. Pulling cable and electrical circuits is easier when the workstations are located adjacent to walls and columns. The walls and columns can serve as anchoring points along which to string wiring. Locations that are in the middle of the room normally require floor ducts, conduits, or the installation of special power poles that provide a path from the ceiling. Your data cabling should not run through the same conduits or pathways as the electrical wiring. This will almost certainly cause interference on your data lines, and thereby corrupt your data.

Data cabling consists of essentially three types, although there are subgroups within each type. Please be sure to have the correct subgroup pulled. One type is called twisted pair cabling, and is the same type often used for telephone lines. This cabling consists of wire pairs, either shielded or unshielded. Shielded cable has a metal sheath surrounding the wire pairs, helping protect the data from interference.

A second type is called coaxial cabling. The cable used for cable TV in your home is coaxial cable. This consists of wire wrapped by wire and sharing the same axis - - hence the term "coaxial." It is usually much thicker and less flexible than twisted pair, but allows for a greater volume and speed of transactions, less electrical interference, and a low error rate.

The third type is called fiber optic cabling. Instead of using electrical impulses transmitted via a wire, glass or plastic transmits light which has been converted from electricity. It has been the most expensive type of cabling of the three mentioned here, but the price is falling quickly. It offers more volume and speed than coaxial cable, is more immune to electrical interference, and has greater security.

Computer Table/Stand

Depending upon the location, you may wish to buy a special table or stand for your computer. These often are sturdier than typical furniture and often have certain special features which make computer equipment installation easier. These amenities include holes for data cabling and for locking or securing equipment.

Carefully consider the size of the furniture; depending upon the type of usage, additional surface may be desired for books and writing pads. Another consideration is the height of the table. For public access catalogs, be sure to make these high enough to require the patrons to stand while using them. This encourages faster turnover, and is helpful if you are limited in the number of workstations you can afford. Please include at least one seated workstation at wheelchair height for physically disabled patrons. You may want to have other seated workstation locations for those doing lengthy research. Be sure to purchase wooden chairs for the seated stations as they are less likely to build up static electricity charges.

Printer Stand

This is an essential piece of furniture which is specifically designed to enhance the flow of printer paper. Some printer stands are constructed with lockable bins for the printer paper supply, which is a nice security feature for public access catalog workstations. Some printer stands contain catch baskets which refold the printed output, making it easier to handle after printing. Some models even have a lockable bin to catch the output, which may be useful for sensitive reports like overdue notices.

Surge Protector

This device is plugged into the wall and the computer power cord is plugged into it. Some surge protectors have connectors for telephone lines also. Surge protectors have special circuitry which detects sudden increases in voltage and current called surges and spikes, depending upon how quickly they occur. The circuitry is designed to disconnect the computer from the increase, and thereby help protect it from damage. Since surge protectors must react quickly and cut off high voltage, the better devices respond faster and cut off more excess voltage. Look for devices that respond within one nanosecond (one billionth of a second) and which allow, at the most, 300 volts to pass through. Consider purchasing surge protectors which have the power cord attached to the end, rather than those which are flat and designed to cover the existing electrical socket. Some devices that cover the socket may not properly fit over that socket. This can cause a loose connection, which could be disastrous. A surge protector for every computer or terminal is a necessity.

Uninterruptible Power Supply (UPS)

This is a battery backup device that detects a lowering of current (brown-out) or loss of current (black-out) and reacts quickly to increase the power to suitable levels. The UPS is plugged into the proper electrical outlet, and then the file server or computer is plugged into the UPS. This will help avoid data loss and computer system damage from brown-outs and black-outs. The UPS also allows you the time to shut down your system in the normal manner, which can avoid system damage and data loss. In purchasing a UPS, consider the overall power consumption (in watts) of all of the devices plugged into it. Usually the UPS vendor can tell you how much time you have, based on the combined wattage of the connected devices, before the power in the batteries is exhausted.

Fire Extinguisher, Computer

Be sure at least one of the fire extinguishers purchased can be used on Class C (electrical) fires. Carbon dioxide (CO_2) extinguishers are used frequently in areas which have a Class C (electrical) fire potential. If possible, HALON should not be used on electrical fires because the powder corrodes electrical equipment. A placard on the fire extinguisher should indicate pictorially and in writing which class fire it is designed to combat.

Anti-Static Mat

Static is one of the worst enemies of computers and disks. It corrupts data and damages equipment. Anti-static mats installed on the floors adjacent to workstations can serve to help bleed this static electricity from the operators before they touch the workstation or disks.

TRAINING

Once the functional specifications have been written, the retrospective conversion has been completed, and the hardware and software have been installed, the last item remembered is usually training. Actually, training should be considered from the beginning of the project. When writing the automation plan, thought should be given as to the manner and time involved in training the library staff and training your patrons. While it may be one of the last items completed in the project, it certainly shouldn't be the shortest. Training may continue long after the system has been implemented.

Training Staff

Most vendors provide some type of training on their system; whether it will be enough will remain to be seen. Everyone learns differently. Just because a vendor will come to train your staff for one day, don't assume that the next day your staff will be ready to serve your patrons using the system. Training does not happen in one day; it happens over time.

If at all possible, load a training database. This database could be a copy of your real database or just a part of it. It will be deleted before your library actually implements the system. This will provide a place staff can make mistakes without worrying about the results. They can try various functions and not worry about charging a $300 fine to the chair of the library board.

Some policies and procedures will need to be updated. Workflow patterns will change. Use the training provided to begin to understand how policies could be updated and workflow could be enhanced. Again, these issues will continue beyond the implementation of the system. With the continual upgrades of the system software, policies, procedures, and workflow issues may never be stagnant again!

Vendors approach training in many different ways. Following are just a few of the major options.

Customized Training

In this situation, the vendor normally provides you with a specific number of hours or days of training on-site. You can decide the areas of training. For example, if you had a relatively large circulation staff, you may have the vendor provide their circulation training twice, and forego any training on the public access catalog.

There may sometimes be hidden costs. Determine if all costs of this training are covered in the initial contract. For example, will the library be liable for the trainer's expenses while training, or is this covered in the purchase price of the system?

Structured Training

The vendor can provide specific training modules or packages which are either purchased separately or are included in the purchase price of the system. Normally there is a training package for each functional module purchased by the library. Some packages may be more extensive than others. For example, the public access catalog training may be a half day, but the circulation training may be a full day.

Regional Training

Some vendors provide scheduled training at varying locations. Instead of providing training for three or four librarians at a small library, they are able to provide training for many librarians within a geographic area. This reduces their cost in training, and will probably reduce yours.

Sometimes these schedules are erratic. They do not necessarily train at the same locations on the same topic every year. In addition, if you are the only library in your area to implement the vendor's system, you may have to travel quite a distance to attend this type of training.

In-House Training

Some libraries prefer to have the vendor train one or two librarians and have the librarians train the rest of the staff. This can reduce training costs, but adds additional work to existing staff. If training will be added to their job description, then other tasks will not be done. There may be a decrease in initial costs, but there may be an increase in salary costs (hiring personnel) or a decrease in service.

Larger libraries in particular find it very economical to hire one person who will train all staff on the system. With the high turnover rate, this may well be a wise decision on their part. If someone in your library will be conducting training, please refer to Appendix F.

Videotapes

Some vendors are providing videotapes in addition to or in lieu of personal training. This can be a very inexpensive way to train your staff. However, there is no interaction with the trainer. Some people learn well from a videotape; others need a classroom situation and hands-on training.

Manuals

Believe it or not, there are people that can learn software from a manual. If there are people like that in your library, give them a manual, time to read, and time to experiment with the system.

Telephone Support

Some vendors provide no specific training. They provide telephone support for questions, but feel their system is very simple and will need no additional training. This usually reduces the cost of the system, but leaves training, if necessary, in the hands of the library.

LOG BOOKS

It is very important for those who follow in your footsteps to be able to understand the chronology of your automated system. If something should happen to the person who manages the automated system and/or the local area network, what information will others need to continue the operation? This information should be gathered together in a log book. Information such as policies and procedures pertaining to the system, phone numbers for assistance, and reasons for decisions and actions taken should be found here. A log book should be updated at least every six months. Following is a list of items to be included in a log book.

Cover sheet(s) with computer serial numbers

Software version numbers (DOS, network, automation system)

Phone number(s) to call for problems with either hardware or software

Procedures for starting and operating the computer system

Procedures for making backups of software and the locations for storage

Procedures to follow when the system goes down

Master copies of forms used with the system

Log every decision or action taken concerning the system and the reason(s) behind it. Entries for problems should include:

Date of problem
Time of occurrence
Name of staff member who reported problem
Name of repair person who took the call
Description of the problem
Time of call back from repair service
Name of repair person who returned call
Action taken
Comments

Based on "Small Automation System Log Books and Backup Procedures" by Roy C. Lewis. Published in Northeast Texas Library System Newsletter #85 (Dec. 1992/Jan. 1993) p. 7.

Appendix A

RETROSPECTIVE CONVERSION OPTIONS

Online, Shared Cataloging Database

Microcomputers are used to access large databases of bibliographic data. Databases such as OCLC, RLIN, and WLN are composed of cataloging which was contributed from their members. In other words, libraries who are members of OCLC can use this database to find cataloging for materials they have purchased, or, if not found, they will catalog the piece and contribute their cataloging data to the database.

The searching is done online by the library, which means that the librarian will interact with the computer. The database contains cataloging from many sources, and is called shared cataloging.

To use one of these databases, the library would have to become a member of the group or make special arrangements with a neighboring library with access.

Batch, Shared Cataloging Database

The library sends the conversion vendor a list of unique numbers from their materials. A microcomputer using database, spreadsheet, or word processing software is used to key in the LCCN and/or the ISBN/ISSN for the library's collection. These disks are sent to the vendor, who uses a program to match the numbers to those in USMARC records. These USMARC records are then copied to disks or magnetic tape and sent to the library.

The library sends the vendor the LCCN/ISBN in batch (all at once) and the vendor searches a shared database, such as OCLC or RLIN, to match the numbers.

CD-ROM Bibliographic Database

The library can purchase or lease a CD-ROM database of USMARC bibliographic records. The library would install a CD-ROM drive on their microcomputer and search the database as they would an online database. These records can be edited and saved for future use.

Contracted, Customized Conversion

The library can send the conversion vendor their shelflist or their machine-readable database, if one exists. The vendor performs all work desired by the library, which could include: matching LCCN/ISBN/ISSN to find USMARC records, inserting location and call number information into the record, transferring holdings information, accession numbers, internal notes, or fund accounting information. The vendor can create an original USMARC record for any material for which a USMARC record cannot be found. Specifications for this type of conversion have to be written in a exacting manner. The vendor will perform only what is stated. Nothing should be assumed.

Original Local Input

The library can purchase software that will create USMARC records when the library staff enters bibliographic information locally. Since the data is in the USMARC format, it can be loaded into most library software programs. Another option is to catalog the materials directly into the automated library system. Most library software vendors provide the capability to create original cataloging in the USMARC format.

Appendix B

TO MANUALLY INPUT OR PURCHASE BIBLIOGRAPHIC RECORDS: THAT IS THE QUESTION

It is becoming increasingly apparent that purchasing USMARC-formatted bibliographic records is more appropriate than entering the local library's shelflist data manually. This is now true for any library large enough to automate its circulation control operations and/or public access catalog, and the reasons are more than strictly economic.

USMARC record import/export capability is no longer restricted to the realm of the expensive minicomputer-based system. It is now possible to have this capability on an IBM PC compatible system for less than $10,000.

> Many microcomputer-based systems have the ability to load and export records in USMARC format. Although there are some errors associated with a few export software routines, the advantages of this capability outweigh other data storage methods.

For bibliographic database creation, the local labor costs are virtually identical either for inputting all of the data from a Library of Congress catalog card, or for extracting USMARC data from a CD-ROM cataloging system.

> The exact bibliographic data entry rate depends upon numerous site-specific variables, including the operator skill/experience and the quality of the shelflist. Nevertheless, studies have revealed that a reasonable average keystroking rate for entering all of the information from an LC card is 30-40 records per hour. For the CD-ROM based Braznet data entry operators, the documented average database conversion rate reached a maximum of 43 records per hour. Therefore, the difference in conversion rates is close enough that individual library operational characteristics would determine which method is faster.

Keystroking is an error-prone process. Typographical error rates typically exceed 5 percent, and this translates into a corresponding loss of collection access. This problem is particularly acute when using volunteers or other large labor pools, where labor skills vary widely, and training overhead is high due to frequent turnover.

> For example, if the operator misspells the author's name, the computer will index it exactly as it was misspelled. Thus, the author access to the record is lost. Patron behavioral studies show that users assume that the computer is correct. Therefore, when a computer states that the library does not have the title, the patron will simply give up, usually without asking for staff help.

The typographical errors from keystroking are virtually eliminated by MARC "copy-cataloging," a process by which the library uses (and copies) existing electronic USMARC cataloging. Moreover, this USMARC cataloging provides higher quality records, taking into account the new AACR2 cataloging rules and Library of Congress Subject Headings.

> By copying existing cataloging, the library must keystroke only its specific local information. This information includes call numbers, locations, and the barcode numbers affixed to the library materials. Therefore, for the same labor costs, the library can obtain higher quality USMARC cataloging, and avoid the loss of collection access that will occur when typographical errors appear in critical data fields. Also, since Library of Congress Subject Headings are a de facto U.S. standard, their use in the local library database provides a more universally accepted means of access to the collection. This can help local patrons use other libraries throughout the United States, as these libraries are likely to also employ LC subject headings. Visitors with LC subject heading knowledge could more easily search the local library catalog, thereby reducing the local library staff's instructional workload.

The extra cost of the disk storage for USMARC records is relatively low, and sometimes non-existent.

> One library automation vendor has stated that their recommended disk space formula for the keystroking data entry method is 1,000 records per megabyte. For full USMARC records, the formula is 500 records per megabyte. Therefore, a library with 20,000 titles would require a 20 megabyte hard disk for keystroked title entries, and a 40 megabyte hard disk for USMARC. Since a 20 megabyte hard disk is nearly impossible to purchase, the library would have to purchase a 40 megabyte hard disk as a minimum. A library with 20,000 titles would pay no extra cost, because the smallest available hard disk would suffice to contain either data format.

The only major difference between the USMARC vs. non-USMARC records option is the method and cost of obtaining USMARC records both for retrospective and for ongoing database maintenance.

> Inputting records into an existing system does not require any additional resource commitment other than the labor and the shelflist, since the system itself provides all the necessary equipment (i.e., a keyboard, a computer, and the data storage device). The USMARC record copy-cataloging option requires additional resources. These generally include some type of access to the USMARC records, not only for retrospective conversion of the existing shelflist, but also for the ongoing cataloging of library materials during and after system implementation.

There are many different conversion options for accomplishing these tasks, and the costs depend not only upon the conversion option, but also upon the vendors who provide that particular option's products and services. It is therefore necessary for every library to analyze its own needs and to consider all of its alternatives. Nevertheless, a hypothetical library has been created as follows.

Current Bibliographic Title Count:	20,000 records
Number of Titles Added Annually:	1,250 records
Hourly Title Data Conversion Rate:	35 records/hr.
Hourly Staff Compensation, w/benefits:	$5.00/hr.

Three conversion options for USMARC records have been included, using actual vendor quotes. Each option contains costs for the retrospective conversion and for the ongoing database maintenance.

CONVERSION OPTION #1

The library purchases the conversion service from its local automated system vendor.

Retrospective Conversion Costs:	
20,000 records @ $0.30/record	$6,000
Delivery time: 4 weeks	
Retrospective Conversion Per Record Charge:	$0.30
Ongoing Database Maintenance Costs:	
1,250 records @ $0.30/record	$375/yr.
Ongoing Per Record Charge:	$0.30

Advantages:	Faster delivery No overhead
Disadvantages:	No library control over process Retrospective conversion is more expensive than other options No ongoing cataloging methodology, except continuing this process with the same vendor

CONVERSION OPTION #2

The library purchases a CD-ROM cataloging system, and performs retrospective conversion and ongoing database maintenance in-house.

This option assumes that the library already has a microcomputer available for CD-ROM operations. There are four cost components associated with this conversion option A) CD-ROM equipment and database; B) in-house retrospective conversion labor costs; C) ongoing CD-ROM database costs; and D) in-house ongoing database maintenance labor costs.

A) CD-ROM Equipment and Database:

CD-ROM Drive (Includes 1st Year Hardware Support)	$500	
CD-ROM Database, Search Software, Manuals (Includes 1st Year Software Support)	$1,690	
Total for CD-ROM Equipment and Database:		$2,190

B) In-House Labor Costs:

20,000 titles @ 35 titles/hr. @ $5.00/hr. Completion Time: 14 weeks		$2,857
Total Costs for Retrospective Conversion (Includes labor and all 1st year CD-ROM Costs):		$5,047
Retrospective Conversion Per Record Charge:	$0.25	

Advantages:	Library has control of project Library saves $953 in the first year and owns the CD-ROM cataloging system Library has ongoing method for obtaining USMARC records available in-house
Disadvantages:	Slower retrospective conversion completion time Ongoing cataloging unit costs are higher than with other options

C) Ongoing CD-ROM Database Costs:		
CD-ROM Drive Hardware Support (After 1st Year)	$120/yr.	
USMARC Database Monthly Updates (Includes All Software Support After 1st Year)	$1,690/yr.	
Total Ongoing CD-ROM Database Costs:		$1,810/yr.
D) In-House Ongoing Database Maintenance Labor Costs (1,250 titles/yr. @ 35 titles/hr. @ $5.00/hr.)		$179/yr.
Total Costs for Ongoing Database Maintenance		$1,989/yr.
Ongoing Per Record Charge:	$1.59	

Therefore, the ongoing costs to maintain a MARC-based bibliographic database include the sum of C and D above, which is $1,989/yr. The per record cost would be $1.59 ($1,989/1,250 records per year).

Purchasing the CD-ROM seems advantageous, based on the costs savings associated with the *retrospective* conversion. Nevertheless, the *ongoing* database maintenance might become expensive, particularly if the library added only a small number of bibliographic records annually. Our example library would pay $1.59 per bibliographic record. In the next conversion option, the library would pay only $0.42 per MARC record. Under this conversion option, our example library would have to add 4,736 records annually to reduce the unit record cost record for CD-ROM to equal the cost in Option 3.

CONVERSION OPTION #3

The library uses a batch-process bibliographic utility that matches the library's LCCNs and ISBNs/ISSNs against that utility's database.

Retrospective Conversion Costs: 20,000 records @ $0.42/record	$8,400
Retrospective Conversion Per Record Charge	$0.42 /record
Ongoing Database Maintenance Costs: 1,250 records/yr. @ $0.42/record	$525 /yr.
Ongoing Per Record Charge:	$0.42 /record

Advantages:

- Faster database delivery
- Little or no staff overhead
- Ongoing conversion is less expensive than for CD-ROM (in this example)

Disadvantages:

- No library control over process
- Retrospective conversion more expensive than other options
- No ongoing cataloging methodology, except to continue this process with the same vendor
- Library must find another source of MARC records for the non-matches

It can be more expensive for the library to input the records now, extract them from the system at the end of its four-year technological lifespan, upgrade these non-standard records to USMARC for loading into a newer system requiring MARC records, than to convert to USMARC initially. In addition to the extra expense, the library and its patrons would suffer through four years' usage of an inferior bibliographic database, and increased retrieval failures due to the inaccurate inputting. Moreover, the library would not as easily be able to participate in resource-sharing projects, since most of them require standard data formats in order to exchange electronic information.

Two cost scenarios have been identified where our example library would input the shelflist data, and then pay for upgrading the database to MARC. For both scenarios, the costs used were already cited in this discussion, and included actual vendor costs for MARC upgrade service. In Scenario 1, the estimated savings is approximately $340 annually. In Scenario 2, however, the library would actually spend approximately $580 *extra* annually for inputting records instead of purchasing MARC records.

Scenario 1: Inputting, and subsequent MARC upgrade versus MARC from the outset by purchasing CD-ROM, performing the retrospective conversion and maintaining the database in-house.

The library began with 20,000 records and added 1,250 records per year over the next four years. When the library outgrew its system at the end of four years, the database contained 25,000 records. This would be the number of keystroked records that require the MARC upgrade in order to load the database to a new library automated system. To compare the costs, there are four components: 1) equipment required to create the database; 2) labor to create the database; 3) database disk storage, and 4) MARC upgrade service for 25,000 bibliographic records.

Scenario 1 Cost Summary

		Manual	CD-ROM (MARC)
1)	Equipment	$ 0	$ 7,620
2)	Labor	3,571	3,571
3)	Disk Space	200	200
4)	Database Upgrade to MARC	6,250	0
TOTALS		$10,021	$11,391

Scenario 1 Costs Details

1) Equipment required to create the database:

Manual: $0	CD-ROM:
(None–included with system)	($2,190 for the first year, and $1,810 for each of the next three years: $7,620)

2) Labor to create the original database

Manual: $3,571	CD-ROM: $3,571
(25,000 records @ 35 records/hr. per hour @ $5.00/hr. = $3,571)	(25,000 records @ 35 records/hr. @ $5.00/hr. = $3,571)

3) Database disk storage

Manual: $200	CD-ROM: $200
(40 megabyte hard disk)	(40 megabyte hard disk)

4) MARC upgrade service for 25,000 keystroked bibliographic records

Manual: $6,250	CD-ROM: $0
(25,000 records @ $0.25/record = $6,250)	

Scenario 2: Inputting, and subsequent MARC upgrade versus hiring the local library automation vendor to perform the retrospective and ongoing MARC database operations.

As in Scenario 1, the library began with 20,000 records and added 1,250 records per year over the next four years. When the library outgrew its system at the end of four years, the database contained 25,000 records. This would be the number of records that require the MARC upgrade in order to load the database to a new library automated system. To compare the costs, there are four components: 1) equipment required to create the database; 2) labor to create the database; 3) database disk storage; and 4) MARC upgrade service for 25,000 bibliographic records.

Scenario 2 Costs Summary

		Manual	CD-ROM (MARC)
1)	Equipment	$ 0	$ 0
2)	Labor	3,571	7,500
3)	Disk Space	200	200
4)	Database Upgrade to MARC	6,250	0
TOTALS		$10,021	$7,700

Scenario 2 Costs Details

1) Equipment required to create the database:

Manual:	$0	Vendor-Supplied Conversion:	$0
(None–included with system)		(None–vendor-supplied)	

2) Labor to create the original database

Manual:	$3,571	Vendor-Supplied Conversion:	$7,500
(25,000 records @ 35 records/hr. @ $5.00/hr. = $3,571)		(25,000 records @ $0.30/record = $7,500)	

3) Database disk storage

Manual:	$200	Vendor-Supplied Conversion:	$200
(40 megabyte hard disk)		(40 megabyte hard disk)	

4) MARC upgrade service for 25,000 keystroked bibliographic records

Manual:	$6,250	Vendor-Supplied Conversion:	$0
(25,000 records @ $0.25/record = $6,250)			

In summary, it is false economy to save money by using manually input records, even if the library operates a single workstation circulation control system. A system this small would still involve a four-year total library investment exceeding $30,000. If, in the pursuit of cost savings, the library realized an actual *loss*, it would be a case of poor management. This waste of resources is exacerbated since, by using USMARC records from automation project inception, the library and its patrons would have reaped the benefits of enhanced collection access, improved resource sharing, and more effective public service.

Appendix C

FUNCTIONALITY OF MICROCOMPUTER-BASED INTEGRATED LIBRARY SYSTEMS

These lists describe some of the basic system characteristics that client libraries have considered important for their daily operations. Please use these lists as a starting point from which to establish your own automation needs. Other lists of functional specifications are available, and should be read for ideas when you write functional specifications for your system. Two excellent lists are:

Boss, Richard W. "The Procurement of Library Automated Systems," *Library Technology Reports* 26(5):629-749 (September-October 1990)

Boss, Richard W. "Technical Services Functionality in Integrated Library Systems," *Library Technology Reports* 28(1):8-56 (January-February 1992).

CIRCULATION FUNCTIONAL SPECIFICATIONS

1. The system should allow easy access between various functions in the circulation control system with a minimum of keystrokes.

   Example: When charging a book, the system states that the patron is delinquent. Without leaving the charge function, the circulation clerk can determine the reason for the delinquency and allow the patron to remedy the situation.

2. All changes to all files should be immediate, not updated in a later batch or background operation.

   Example: When an overdue item is discharged, its status should immediately be changed to "shelving" and the patron's status should immediately be changed to "delinquent."

3. It should be easy to register a patron in the system, and the system should permit materials to be charged immediately upon registration.

4. Patron files should contain only current information, such as books charged and fines outstanding. To protect a patron's privacy, no historical information about reading habits should be stored.

5. The system will automatically block a patron from borrowing items if:

   the patron is delinquent, e.g., overdues, lost books;
   the patron is not registered;
   the patron's registration has expired;
   the patron's card is missing or stolen;
   the patron's registration information is incomplete;
   the patron has charged too many items;
   the librarian has asked the system to block that patron.

6. The system will automatically block the circulation of specific items that are:

non-circulating;
reserved for another patron;
not discharged;
not owned by this branch;
not completely entered in the system;
missing, lost, or "claims-returned."

7. The charge and discharge functions should allow the use of light pens to scan patron and item barcode labels.

8. While in the charge function, it should be possible to add a new patron or item using "on-the-fly" registration, and then proceed with charging materials.

9. The loan period should allow for holidays and book-drops.

10. The loan period should allow for a grace period.

11. The renewal function should work exactly the same as both the charge and discharge functions, but should also include an additional block for exceeding the prescribed number of consecutive renewals for an item.

12. The hold function should permit:

system-wide holds, by trapping the first copy of a title discharged at any branch;
branch holds, by trapping the first copy of a title discharged at that branch;
item specific hold, by trapping the exact copy of the title discharged;

rearranging the order of the queue;
the tracking of an item though interbranch shipment;
the automatic generation of a pick-up notice;
the system to alert the librarian when the number of holds on a title grows beyond a certain number;

a hold expiration date, with automatic deletion of the hold after the date has passed;
automatic cancellation and patron notification of all holds affected by the loss or withdrawal of library materials;
manual cancellation of holds by an authorized operator with the option to notify the affected patrons.

13. If the library desires a recall function, the system should allow the selection of patrons who will receive recall notices, and should cause a block against that patron if the item is not returned on time. A recall is a notice sent to a patron asking them to return an item though it is not yet due.

14. **The fines and fees functions should permit:**

the automatic calculation of fines based on the patron category, material type and the amount of time overdue, allowing for grace periods and a maximum fine per item;

the automatic posting of fines to a patron's record, upon discharge or renewal;

default cost assignments for damaged items by material type when specific costs are not available;

manually assigned fees by an authorized operator;

the assignment of partial payment or waivers to individual line items in the patron's file, with dates of payment and clerk conducting the transaction.

15. The notice production function should contain the following features:

library-defined periods for the timing of notice production, and for the number of notices sent;

library-defined wording for the notices;

printing of notices in zip code order and in a format suitable for data mailer forms;

space for the automatic printing of notice type, message, patron name and address, author/title/call number, barcode number, and due date;

different notice types, including an overdue reminder, fines owed, holds, and ILL requests received.

16. The statistical reports function should allow:

savable basic report elements such as formats, data content, headings, mathematical operations, output medium, batch or online access;

time periods of compilation, such as day, month-to-date, academic year, fiscal year, and comparison to previous parallel period;

compilation by password, terminal, branch, entire system, patron class, call number, media code;

reports on items charged, renewed, recalled, missing, lost, rarely circulated; reports on patrons registered, added, deleted, blocked;

reports on titles held, added, deleted, lacking item records;

fees collected or waived and by whom.

17. The system should be able to load and index complete item records which have been added to the USMARC bibliographic records.

18. The system should provide an audit trail with provisions to identify who cleared fines, accepted payments, claimed items returned, or forgave lost books.

PUBLIC ACCESS CATALOG FUNCTIONAL SPECIFICATIONS

1. The Public Access Catalog (PAC) must display all holdings of the library contained in the bibliographic database, with item information.

2. The PAC must display information from the shelflist, with item information, accessible by call number.

3. The PAC must allow the creation of a stopword list, and allow an authorized operator to search by a stopword. A stopword is a word such as "the," which could seriously slow down the system in a search.

4. The PAC must allow search and retrieval by:

   ISBN;
   ISN;
   LCCN;
   bibliographic utility control number, such as OCLC number;
   author, both personal and corporate;
   title;
   author and title combined;
   series;
   call number;
   added entries such as additional authors;
   unique item number, such as accession number or barcode number;
   subjects;
   keyword.

5. The PAC must allow a search to be limited by:

   language, e.g., Spanish, French;
   date of publication;
   format, e.g., serial, video.

6. The PAC must display circulation status of items, i.e., whether or not an item is charged, and so, theoretically, on the shelf.

7. The PAC must provide prompts and messages to help a patron learn how to use the system.

8. Access to the PAC must be provided by direct connection (workstations in the library) and dial-up ports (for patrons with microcomputers and modems in their homes or offices).

9. Access to the PAC shall be controlled by a security authorization system.

10. The PAC should provide online help messages that reflect the function being attempted when the request for help was made.

11. The PAC should allow right truncation of search terms, e.g., "Librar$" would retrieve library and librarians.

12. The PAC should provide for "see" and "see also" references.

13. The PAC should allow browsing of the database. "Browsing" means access to an alphabetical or numerical listing of terms.

14. The PAC should allow Boolean searching of the database using "and, or, not" expressions.

15. The PAC should provide keyword searching by:

    title;
    author;
    subject;
    any combination of these fields.
    ("keyword" is a search by any non-stopword in a field. For example, "title= october" would retrieve *The Hunt for Red October*).

16. The library should have the option of determining which fields and subfields are searched during a keyword search.

17. The PAC should allow users to correct input errors before executing a search.

18. The PAC should provide users with brief, descriptive error messages.

19. The PAC should allow a user to stop a search that is being executed.

20. The PAC should display a "wait" message while it is processing.

21. The PAC screen displays should be clear and uncrowded.

22. The library should have the option of determining which elements of a bibliographic and item record will be displayed.

23. The library should have the option of customizing the stop wordlist.

24. The PAC should allow retrieved records to be printed by patrons.

25. A user should be able to initiate and terminate a search with a maximum of three keystrokes.

26. The PAC should be able to terminate a search session after a period of inactivity, as specified by the library.

27 The PAC should store search results until the user completes the search session.

28. The PAC should be able to scroll or page backwards and forwards in the screen displays.

29. The library should be able to specify the maximum number of "hits" that will be retrieved. This should also be able to be overridden by an authorized operator.

30. The library should be able to limit the number of pages or records printed for each search session.

31. The patron should be able to specify which records or range of records will be printed.

32. All displays, except the USMARC record display, should have field labels in common language so they are meaningful to the general public.

GENERAL SYSTEM FUNCTIONAL SPECIFICATIONS

1. The Library must be able to easily assign and reassign authorization ID's to each workstation or port.

2. The system should be capable of accepting data in USMARC format.

3. The system should retain all data elements present in the USMARC record input.

4. The system should be capable of exporting bibliographic records in USMARC format with all data elements present, as they were in the input record, and should reflect all updates that have been made.

5. Input and updating of records should be possible through:

   USMARC, OCLCMARC, or RLINMARC formatted tapes;
   direct data input from all bibliographic utilities;
   direct data input from cataloging system workstations, such as CD-ROM based BiblioFile;
   direct keystroking into a system-supplied MARC workform;
   data input from library jobbers, either via magnetic disk or direct data transfer.

6. The system should provide the ability to generate "see" and "see also" references.

7. The system documentation should clearly explain system operation.

8. The system should be integrated. Integrated means that the system uses a common database for most applications, allowing users to search the entire database with one search command and allowing users to move freely from one application to another.

9. The system should allow multiple users to access different subsystems at one time.

10. The system should provide an interface to move records from the local cataloging source to the automated system.

SIZING YOUR SYSTEM

Following are documents that you might find useful in sizing your library automated system. The first document summarizes computer storage needs for your library for five years. With this information, a vendor should be able to provide you a system which will grow with your library for at least five years.

STORAGE NEEDS

Bibliographic Titles

Year 1	Year 2	Year 3	Year 4	Year 5
______	______	______	______	______

Items

Year 1	Year 2	Year 3	Year 4	Year 5
______	______	______	______	______

Patrons

Year 1	Year 2	Year 3	Year 4	Year 5
______	______	______	______	______

Acquisitions

Year 1	Year 2	Year 3	Year 4	Year 5
______	______	______	______	______

Serial Titles

Year 1	Year 2	Year 3	Year 4	Year 5
______	______	______	______	______

Annual Circulation

Year 1	Year 2	Year 3	Year 4	Year 5
______	______	______	______	______

The second document, Workstation Needs, will help you decide how many workstations will be necessary, their locations, and their functions. With this document and the Storage Needs document, a vendor should be able to give you an approximate price for their system.

WORKSTATION NEEDS

Workstation #	Location	Primary Functions	Peripherals
________	______	________________	________________
		________________	________________
________	______	________________	________________
		________________	________________
________	______	________________	________________
		________________	________________
________	______	________________	________________
		________________	________________
________	______	________________	________________
		________________	________________
________	______	________________	________________
		________________	________________
________	______	________________	________________
		________________	________________
________	______	________________	________________
		________________	________________
________	______	________________	________________
		________________	________________
________	______	________________	________________

The next three forms are intended to be used in tandem, so create one set for each workstation location. The first form is the Worksite Task List. This document will describe the types of activities expected to be performed at each location.

Make about six copies of this form. Decide where the first workstation should be placed. Use the list to describe the library activities to be performed at this location. Go to the next location and repeat the process. Consider completing a series of this first form before contacting vendors. You should have an excellent idea of your automation needs and the vendor should be able to provide you with more accurate pricing.

WORKSITE TASK LIST

WORKSTATION #___

LOCATION ____________________

FUNCTIONS: (Mark All That Are Relevant)

- ___Circulation Control:
  - ___Charge/Renewal
  - ___Discharge
  - ___Patron Data Entry/Update
  - ___Title Data Entry/Update
  - ___Item Data Entry/Update
  - ___Fines/Payments
  - ___System Maintenence
- ___Holds/Reserves
  - ___Report Production
  - ___Patron Inquiry
  - ___Title Inquiry
  - ___Item Inquiry
  - ___Parameter File Maintenance
  - ___Other__________________
- ___Public Access Catalog, Staff Use
- ___Public Access Catalog, Public Use
- ___Bibliographic Utility Interface

The second form is the Worksite Software and Equipment List. This document lists the computer equipment and software needed to conduct the activities described in the Worksite Task List (the first form). Each of these items has an associated cost, and by describing the necessary system components for each location, the total costs can be compiled.

Make a copy of this form for each of the workstations. Contact the vendors and give them the information in Section One. The vendor should begin explaining the software and equipment that will be necessary. In some cases, the vendor can supply everything, and in other cases, parts may have to be purchased elsewhere. The Worksite Software and Equipment List can be used to indicate what will be necessary for each workstation. You may find that many of the worksites are almost identical. Simply make multiple copies of the same site. After the vendor has indicated what might be necessary, use the list to question the vendor about acquiring software or equipment not yet discussed.

WORKSITE SOFTWARE AND EQUIPMENT LIST
Section One

__________ Number of Circulation Workstations

__________ Number of Public Access Catalog Staff Use Workstations
__________ Number of Public Access Catalog Public Use Workstations

__________ Number of Titles Currently in your Collection
__________ Estimated Number of Titles in Five Years

__________ Number of Items Currently in your Collection
__________ Estimated Number of Items in Five Years

__________ Number of Annual Circulations Currently
__________ Estimated Number of Annual Circulations in Five Years

WORKSITE SOFTWARE AND EQUIPMENT LIST
Section Two

WORKSTATION #___

LOCATION ____________________

			Initial Cost	Ongoing Cost
Operating System Used				
DOS	Version	_______	________	________
OS/2	Version	________	________	________
Macintosh	Version	________	________	________
Other	Version	________	________	________
Circulation Module			________	________
Public Access Catalog Module			________	________
Bibliographic Utility Interface			_______	________
Local Area Network (LAN)			________	________
Communications Software			________	________
Other			________	________
Other			________	________
Other			________	________
Other			________	________

WORKSITE SOFTWARE AND EQUIPMENT LIST
Section Three

WORKSTATION #___ LOCATION ____________________

	Initial Cost	Ongoing Cost
Microcomputer		
Type ______________________________	________	________
RAM ______________________________	________	________
Additional RAM ______________________	________	________
Hard Drive __________________________	________	________
Disk Drive 5.25 inch __________________	________	________
Disk Drive 3.5 inch ___________________	________	________
LAN Card ___________________________	________	________
Port Board __________________________	________	________
Printer		
System Printer _______________________	________	________
Slave Printer ________________________	________	________
Back-Up System ______________________	________	________
Peripherals		
Light Pen/Laser Scanner _______________	________	________
Modem, Auto-Answer __________________	________	________
Modem, Dial-Out _____________________	________	________
CD-ROM Drive(s) _____________________	________	________
Miscellaneous		
__________________________________	________	________
__________________________________	________	________

The third form is the Worksite Preparation List. This document will list the activities and items needed to prepare the workstation location for software and equipment described previously. The total costs should then be compiled just as for the Worksite Software and Equipment List.

Use one form for each workstation location. This form lists the preparations that must be made in order to have each location in operating condition. Then vendors may offer some assistance by recommending the types of items to be purchased for each location. Please carefully consider safety and security issues. Computers are very sensitive devices and suffer if exposed to significant variations in electricity or environment. Cassette tape backup devices, surge protectors or uninterruptible power supplies, and fire extinguisher are excellent investments.

WORKSITE PREPARATION LIST

WORKSTATION #___ LOCATION ____________________

	Quantity	Unit Price	Total Cost	Ongoing Costs
Electrical Circuits				
20 Amps	________	________	________	________
30 Amps	________	________	________	________
Telephone Line				
Analog	________	________	________	________
Digital	________	________	________	________
Data Cabling	________	________	________	________
Computer Table/Stand	________	________	________	________
Printer Stand	________	________	________	________
Surge Protector	________	________	________	________
UPS	________	________	________	________
Fire Extinguisher	________	________	________	________
Anti-Static Mat	________	________	________	________
Other	________	________	________	________
Other	________	________	________	________
Other	________	________	________	________
Other	________	________	________	________
Other	________	________	________	________
TOTALS		________	________	________

Appendix E

SAMPLE CONFIGURATION COSTS

SAMPLE CONFIGURATION #1

NUMBER OF TITLES	5,000	FILE SERVER	1
NUMBER OF ITEMS	6,000	CIRCULATION WORKSTATIONS	1
NUMBER OF PATRONS	4,000	ONLINE CATALOG WORKSTATIONS	1
ANNUAL CIRCULATIONS	40,000		
ANNUAL ACQUISITIONS	1,000		

This library purchased circulation, public access catalog, and network software. The hardware was not purchased from the software vendor, but from a local vendor. Three dedicated electrical circuits were installed for the file server and two workstations. The library sent the shelflist to a data conversion vendor who provided USMARC bibliographic records, inserted specific local information, and provided smart barcode labels. Patrons were added to the database as an in-house project, using the existing registration cards for information. Barcode labels were attached to the existing patron cards as they used the library. Videotapes were purchased from the vendor to provide training for existing, as well as future staff. USMARC records for ongoing processing were purchased from the book jobber, who also provided barcode labels for those materials.

SUMMARY OF COSTS

CURRENT COSTS	INITIAL	ANNUAL
HARDWARE	$ 7,034	$ 568
SOFTWARE	$ 4,085	$ 250
SITE PREPARATION	$ 995	$ 195
DATA CONVERSION	$ 4,004	
TRAINING	$ 150	
SUPPLIES	$ 919	$ 470
ADMINISTRATION	$ 3,000	$ 3,000
TOTALS	$ 20,187	$ 4,483

PREVIOUS COSTS	INITIAL	ANNUAL
CIRCULATION		$ 5,020
CARD CATALOG		$ 2,605
ADMINISTRATION		$ 2,000
TOTALS		$ 9,625

	MANUAL SYSTEM		AUTOMATED SYSTEM	
	Annual	Totals	Annual	Totals
YEAR ONE	$ 9,625	$ 9,625	$20,187	$20,187
YEAR TWO	$ 9,625	$19,250	$ 4,483	$24,670
YEAR THREE	$ 9,625	$28,875	$ 4,483	$29,153
YEAR FOUR	$ 9,625	$38,500	$ 4,483	$33,636
YEAR FIVE	$ 9,625	$48,125	$ 4,483	$38,119

Over five years of automated system operation, the library will have spent $38,119. During the same period, however, they would have saved $10,006 in ongoing costs by eliminating the manual system.

The initial (first year) system cost, however, was $20,187, which results in an extra expense of approximately $10,562 in the first year. As you can see from the above table, the automated system will not begin to save the library money until after the second year.

This is one reason it is unwise to promote the system to your funding authorities based on the premise that you will save money. Much depends on the functionality desired and the size of the library. You may not save money. You can, however, expect to contain rising costs.

You may be able to convince your funding authorities of the value of an automated system by explaining the following benefits, which are difficult to quantify or are unavailable with manual systems.

Collection Use Statistics

These can help library staff make more informed collection development decisions and, as a result, spend this money more wisely.

Public Relations

Staff will be used more efficiently. This is a chance to reorient staff from dealing with paperwork to dealing with the public.

Automation Appeal

Technology that has been implemented in the library usually raises both the visibility and the usefulness of the library.

Collection Access

Shelf status for all materials is provided immediately for patrons via the public access catalog, eliminating wasted time searching for specific items.

The searching of the public access catalog is both more powerful and flexible.

DETAIL OF COSTS

HARDWARE

File Server

IBM 486 or compatible computer
4 MB RAM
120 MB Hard Drive
3 1/2" and 5 1/4" Disk Drives
DOS 5.0
VGA Color Monitor

$2,230

Maintenance -- $223/year

Workstations (2)

IBM 386 or compatible computer
2 MB RAM
80 MB Hard Drive
3 1/2" and 5 1/4" Disk Drives
DOS 5.0
VGA Color Monitor

$1,349 each	$2,698
Maintenance -- $270/year	

Peripherals

Tape Drive Back-Up	$ 250
Dot Matrix Printer	$ 166
Barcode Reader	$ 396
Uninterruptible Power Supply	$ 599
Portable Inventory Barcode Reader	$ 695
Maintenance -- $75/year	

$7,034

SOFTWARE

Circulation $1,295		
Maintenance -- $125/year		
Online Catalog	$1,295	
Maintenance -- $125/year		
LAN Software/License/Cards/Cabling	$1,495	
		$4,085

SITE PREPARATION

Install 30 Amp Electrical Circuits 3 locations @ $200 each	$ 600	
Cabling	$ 200	
Electric Bill		

Assume each computer uses 300 watts per hour; each computer runs 12 hours per day, 300 days per year; at $0.06 per kilowatt hour:

300 watts/computer x 3 computers = 900 watts
900 watts/hour x 12 hours/day = 10,800 watts/day
10,800 watts/day x 300 days/year = 3,240,000 watts/year

$$\frac{3{,}240{,}000 \text{ watts/year}}{1{,}000 \text{ watts/kilowatt}} = 3{,}240 \text{ kilowatts}$$

3,240 kilowatts x $.06/kilowatt	$ 195	
		$ 995

Maintenance -- $195/year

DATA CONVERSION

USMARC matched 90% collection using LCCN/ISBN/ISSN from shelflist cards; vendor will add call number, location, price, and barcode number to record; vendor provides smart barcode labels and protectors

$.58/item for 5,400 items	$3,132

For remaining 10%, vendor enters shelflist information into USMARC format; information includes call number, location, price, and barcode number; vendor provides barcode labels and protectors

$.62/item for 600 items	$ 372

Patron Conversion

Staff enters 4,000 patrons @ 40/hr. @ $5.00/hr.	$ 500	
		$4,004

TRAINING

Purchase training videos	$ 150	
		$ 150

SUPPLIES

USMARC bibliographic records from book jobber		
$.20/title for 1,000 titles	$ 200	
$.05/item for 1,500 items	$ 75	
Annual Cost -- $275		
Dumb Barcode Labels for Patrons		
$32/1,000 for 5,000 patrons	$ 160	
Dumb Barcode Labels for Items		
$32/1,000 for 1,000 items	$ 32	
Annual Cost -- $32		
Barcode Label Protectors		
$29/1,000 for 1,000 items	$ 29	
Annual Cost -- $29		
Continuous Spine Labels		
$35/5,000 for 5,000 items	$ 35	
3 1/2" Diskettes		
$19/10 for 20 diskettes	$ 38	
Annual Cost -- $38		
Computer Paper	$ 96	
$24 for one box		
Annual Cost -- $96		
Surge Protectors		
$57/each for 2 protectors	$ 104	
Fire Extinguisher	$ 150	
		$ 919

ADMINISTRATION

Approximately 6 hours per week, or about 300 hours annually, is necessary to maintain and upgrade the automated system.

300 hours x $10/hour	$3,000	
		$3,000

CIRCULATION MAINTENANCE

Card Filing

The library circulation clerk can file and unfile 4 cards per minute, or 240 per hour. With 40,000 annual circulation transactions, 80,000 cards are filed per year. Divide 80,000 cards by 240 cards per hour, then multiply the result by the clerk's wage.

$$\frac{80{,}000 \text{ cards}}{240 \text{ cards/hour}} = 333 \text{ hours}$$

333 hours x $5.00/hr. = $1,665

$1,665 annually has been saved.

Overdues Production

The circulation clerk types 20 notices per hour. Based on a 3 percent overdue rate, 1,200 notices are typed annually.

$$\frac{1{,}200 \text{ notices}}{20 \text{ notices/hr.}} = 60 \text{ hours}$$

Each patron averages 2 notices per envelope; therefore, 600 envelopes were stuffed and stamped at a rate of 120 per hour.

$$\frac{600 \text{ envelopes}}{120 \text{ envelopes/hr.}} = 5 \text{ hours}$$

Therefore, the total overdue processing was 65 hours.

(60 hours + 5 hours) = 65 hours
65 hours x $5.00/hr. = $325

$325 annually has been saved.

Monthly Statistics

Monthly circulation statistics reports required approximately 4 hours for the librarian to compile, or 48 hours per year.

48 hours x $10.00/hr. = $480

$480 annually has been saved.

Inventory Report

The librarian and one clerk compiled the inventory in approximately one month over the summer. They spent approximately 170 hours on the inventory.

(170 hours x $10.00/hr.) + (170 hours x $5.00/hr.) =

$1,700 + $850 = $2,550

$2,550 annually has been saved.

CARD CATALOG MAINTENANCE

Card Filing

The librarian filed an average of 2 cards per minute, or 120 per hour. The library adds 1,000 titles per year. Each card set averages 5 cards, so 5,000 cards are filed annually. Divide 5,000 cards by 120 cards per hour to determine the number of hours needed.

$$\frac{5{,}000 \text{ cards}}{120 \text{ cards/hr.}} = 42 \text{ hours}$$

42 hours x $10/hr. = $420

$420 annually has been saved.

Catalog Card Production

The librarian cataloged the materials and typed the main entry catalog card at a rate of one every 10 minutes, or 6 per hour. The clerk then photocopied the card and typed the remaining added entry cards at a rate of one every 5 minutes, or 12 per hour.

$$\text{Librarian:} \quad \frac{1{,}000 \text{ titles}}{6 \text{ titles/hr.}} = 167 \text{ hours}$$

167 hours x $10/hr. = $1,670

$$\text{Clerk:} \quad \frac{1{,}000 \text{ titles}}{12 \text{ titles/hr.}} = 83 \text{ hours}$$

83 hours x $5/hr. = $ 415

Cards: 1,000 titles x 5 cards/title = 5,000 cards
5,000 cards x $20/thousand = $100

$1,670 + $415 + $100 = $2,185

$2,185 annually has been saved.

ADMINISTRATION

The librarian spends about 4 hours per week, or about 200 hours annually, in supervision and management duties relating specifically to the manual circulation and card catalog processes.

200 hours x $10/hr. = $2,000

$2,000 annually has been saved.

SAMPLE CONFIGURATION #2

NUMBER OF TITLES	20,000	FILE SERVER	1
NUMBER OF ITEMS	25,000	CIRCULATION WORKSTATIONS	2
NUMBER OF PATRONS	10,000	ONLINE CATALOG WORKSTATIONS	2
ANNUAL CIRCULATIONS	125,000		
ANNUAL ACQUISITIONS	1,000		

This library purchased circulation, public access catalog, and network software. The hardware was not being purchased from the software vendor, but from a local vendor. Five dedicated electrical circuits were installed for the file server and four workstations. The library purchased a CD-ROM database and did in-house conversion. This database was also used as the source of bibliographic records for ongoing processing. An in-house database of patron information will be converted to the vendor's patron format. New patron cards were purchased. The vendor provided customized training for the library on-site. Money was also provided for attendance at annual workshops for continuing education.

SUMMARY OF COSTS

CURRENT COSTS	INITIAL	ANNUAL
HARDWARE	$10,592	$ 888
SOFTWARE	$ 5,585	$ 250
SITE PREPARATION	$ 1,824	$ 324
DATA CONVERSION	$17,490	
TRAINING	$ 850	$ 500
SUPPLIES	$ 971	$ 1,391
ADMINISTRATION	$ 4,000	$ 4,000
TOTALS	$41,312	$ 7,353

PREVIOUS COSTS	INITIAL	ANNUAL
CIRCULATION	$ 9,260	
CARD CATALOG	$ 2,605	
ADMINISTRATION	$ 2,000	
TOTALS		$13,865

	MANUAL SYSTEM		AUTOMATED SYSTEM	
	Annual	Totals	Annual	Totals
YEAR ONE	$13,865	$13,865	$41,312	$41,312
YEAR TWO	$13,865	$27,730	$7,353	$48,665
YEAR THREE	$13,865	$41,595	$7,353	$56,018
YEAR FOUR	$13,865	$55,460	$7,353	$63,371
YEAR FIVE	$13,865	$69,325	$7,353	$70,724

Over five years of automated system operation, the library will have spent $70,724. During the same period, they would have spent only $69,325 in ongoing costs by keeping the manual system. Maintenance of the manual system would have resulted in a savings of $1,399.

The initial (first year) system cost, was $41,312, which results in an extra expense of approximately $27,447 in the first year. As you can see from the above table, the automated system will not save the library money until after the fifth year.

This is one reason it is unwise to promote the system to your funding authorities based on the premise that you will save money. Much depends on the functionality desired and the size of the library. You may not save money. You can, however, expect to contain rising costs.

You may be able to convince your funding authorities of the value of an automated system by explaining the following benefits, which are difficult to quantify or are unavailable with manual systems.

Collection Use Statistics

These can help library staff make more informed collection development decisions and, as a result, spend this money more wisely.

Public Relations

Staff will be used more efficiently. This is a chance to reorient staff from dealing with paperwork to dealing with the public.

Automation Appeal

Technology that has been implemented in the library usually raises both the visibility and the usefulness of the library.

Collection Access

Shelf status for all materials is provided immediately for patrons via the public access catalog, eliminating wasted time searching for specific items.

The searching of the public access catalog is both powerful and flexible.

DETAIL OF COSTS

HARDWARE

File Server

IBM 486 or compatible computer
4 MB RAM
120 MB Hard Drive
3 1/2" and 5 1/4" Disk Drives
DOS 5.0
VGA Color Monitor
$2,230
Maintenance -- $223/year

Workstations (4)

IBM 386 or compatible computer
2 MB RAM
80 MB Hard Drive
3 1/2" and 5 1/4" Disk Drives
DOS 5.0
VGA Color Monitor
$1,349 each $5,396
Maintenance -- $540/year

Peripherals

Tape Drive Back-Up	$ 250
Laser Printer	$ 630
Barcode Readers (2)	$ 792
Uninterruptable Power Supply	$ 599
Portable Inventory Barcode Reader	$ 695
Maintenance -- $125/year	

$10,592

SOFTWARE

Circulation $1,295		
Maintenance -- $125/year		
Online Catalog	$1,295	
Maintenance -- $125/year		
LAN Software/License/Cards/Cabling	$2,995	
		$5,585

SITE PREPARATION

Install 30 Amp Electrical Circuits		
5 locations @ $200 each	$1,000	
Cabling	$ 500	
Electric Bill		

Assume each computer uses 300 watts per hour; each computer runs 12 hours per day, 300 days per year; at $0.06 per kilowatt hour:

300 watts/computer x 5 computers = 1,500 watts
1,500 watts/hour x 12 hours/day = 18,000 watts/day
18,000 watts/day x 300 days/year = 5,400,000 watts/year

$$\frac{\text{5,400,000 watts/year}}{\text{1,000 watts/kilowatt}} = \text{5,400 kilowatts}$$

5,400 kilowatts x $.06/kilowatt	$ 324	
		$1,824
Maintenance -- $324		

DATA CONVERSION

A CD-ROM utility database was purchased for data conversion; a three-year subscription includes the software, monthly updates, and a workstation equipped with a CD-ROM drive

Software	$2,250	
Updates	$5,070/year	
Hardware	no cost	
Shipping	$20/year	$7,340

Library staff members must find a matching record, download it into the system, enter the barcode number and attach a barcode label to the material; approximately one per minute, or 60 per hour

$$\frac{\text{25,000 items}}{\text{60 titles/hour}} = \text{417 hours}$$

417 hours x $10/hour = $4,170	$4,170	
Dumb barcodes are purchased for the conversion $32/thousand for 25,000 items	$ 800	
Patron Conversion		
Patron information had been kept in a database software package; this was converted to the system vendor's patron format	$ 180	
New patron cards were purchased which included the barcode embedded in the plastic		
$.50/card for 10,000 patrons	$5,000	
		$17,490

TRAINING

Vendor Training		
One day customized training $350/day plus expenses	$ 850	
Annual workshops $75/person plus expenses		
		$ 850

SUPPLIES

CD-ROM Database

Software paid above

Updates for 2 years -- $3,380

Shipping for 2 years -- $ 40

Annual Cost -- $855

Dumb Barcode Labels for Items

$32/1,000 for 5,000 items	$ 160
Annual Cost -- $160	

Barcode Label Protectors		
$29/1,000 for 5,000 items	$ 145	
Annual Cost -- $145		
Continuous Spine Labels		
$35/5,000 for 5,000 items	$ 35	
Annual Cost -- $35		
3 1/2" Diskettes		
$19/10 for 40 diskettes	$ 76	
Annual Cost -- $76		
Computer Paper		
$24/box for 5 boxes	$ 120	
Annual cost -- $120		
Surge Protectors		
$57/each for 5 protectors	$ 285	
Fire Extinguisher	$ 150	
		$971

ADMINISTRATION

Approximately 8 hours per week, or about 400 hours annually, is necessary to maintain and upgrade the automated system.

400 hours x $10/hour	$4,000	
		$4,000

CIRCULATION MAINTENANCE

Card Filing

The library circulation clerk can file and unfile 4 cards per minute, or 240 per hour. With 125,000 annual circulation transactions, 250,000 cards are filed per year. Divide 250,000 cards by 240 cards per hour, then multiply the result by the clerk's wage.

$$\frac{250{,}000 \text{ cards}}{240 \text{ cards/hour}} = 1{,}042 \text{ hours}$$

1,042 hours x $5.00/hour = $5,210

$5,210 annually has been saved.

Overdues Production

The circulation clerk types 20 notices per hour. Based on a 3 percent overdue rate, 3,750 notices are typed annually.

$$\frac{3{,}750 \text{ notices}}{20 \text{ notices/hour}} = 188 \text{ hours}$$

Each patron averaged 2 notices per envelope, so 1,875 envelopes were stuffed and stamped at a rate of 120 per hour.

$$\frac{1{,}875 \text{ envelopes}}{120 \text{ envelopes/hour}} = 16 \text{ hours}$$

Therefore, the total overdue processing was 204 hours.

(188 hours + 16 hours) = 204 hours
204 hours x $5.00 per hour = $1,020

$1,020 annually has been saved.

Monthly Statistics

Monthly circulation statistics reports required approximately 4 hours for the librarian to compile, or 48 hours per year.

48 hours x $10.00/hour = $480

$480 annually has been eliminated.

Inventory Report

The librarian and one clerk compiled the inentory in approximately one month over the summer. They spend approximately 170 hours on the inventory.

(170 hours x $10.00/hour) + (170 hours x $5.00/hour) =

$1,700.00 + $850.00 = $2,550

$2,550 annually has been saved.

CARD CATALOG MAINTENANCE

Card Filing

The librarian filed an average of 2 cards per minute, or 120 per hour. The library adds 1,000 titles per year. Each card set averages 5 cards, so 5,000 cards are filed annually. Divide 5,000 cards by 120 cards per hour to determine the number of hours needed.

$$\frac{5{,}000 \text{ cards}}{120 \text{ cards/hour}} = 42 \text{ hours}$$

42 hours x $10/hour = $420

$420 annually has been saved.

Catalog Card Production

The librarian cataloged the materials and typed the main entry catalog card at a rate of one every 10 minutes, or 6 per hour. The clerk then photocopied the card and typed the remaining added entry cards at a rate of one every 5 minutes, or 12 per hour.

Librarian: $$\frac{1{,}000 \text{ titles}}{6 \text{ titles/hour}} = 167 \text{ hours}$$

167 hours x $10/hour = $1,670

Clerk: $$\frac{1{,}000 \text{ titles}}{12 \text{ titles/hour}} = 83 \text{ hours}$$

83 hours x $5/hour = $ 415

Cards: 1,000 titles x 5 cards/title = 5,000 cards
5,000 cards x $20/thousand = $100

$1,670 + $415 + $100 = $2,185

$2,185 annually has been saved.

ADMINISTRATION

The librarian spends about 4 hours per week, or about 200 hours annually, in supervision and management duties relating specifically to the manual circulation and card catalog processes.

200 hours x $10/hour = $2,000

$2,000 annually has been saved.

SAMPLE CONFIGURATION #3

NUMBER OF TITLES	40,000	FILE SERVER	1
NUMBER OF ITEMS	50,000	CIRCULATION WORKSTATIONS	3
NUMBER OF PATRONS	18,000	ONLINE CATALOG WORKSTATIONS	5
ANNUAL CIRCULATIONS	200,000		
ANNUAL ACQUISITIONS	5,000		

This library purchased circulation, public access catalog, cataloging and network software. This was a turnkey system, as hardware and software were purchased from the same vendor. This vender also provides acquisitions, serials, and interlibrary loan modules, which the library hopes to purchase at a later date. Nine dedicated electrical circuits were installed for the file server and eight workstations. The library had been inputting their bibliographic records into the OCLC database. Their records were extracted, sent to a vendor for the creation of smart barcode labels, and loaded into the vendor's database. OCLC continues to be used as the source of bibliographic records for ongoing processing. An in-house database of patron information was converted to the vendor's patron format. New patron cards were purchased. The vendor provided installation, customization and extensive training for the library on-site. Money was also provided for attendance at annual user's group meetings.

SUMMARY OF COSTS

CURRENT COSTS	INITIAL	ANNUAL
HARDWARE	$ 30,523	$ 1,130
SOFTWARE	$ 15,800	$ 1,088
SITE PREPARATION	$ 4,383	$ 583
DATA CONVERSION	$ 34,050	
TRAINING	$ 9,488	$ 500
SUPPLIES	$ 1,726	$ 1,120
ADMINISTRATION	$ 5,000	$ 5,000
TOTALS	$100,970	$ 9,421

PREVIOUS COSTS	INITIAL	ANNUAL
CIRCULATION		$13,840
CARD CATALOG		$12,995
ADMINSTRATION		$ 5,000
TOTALS		$31,835

	MANUAL SYSTEM		AUTOMATED SYSTEM	
	Annual	Totals	Annual	Totals
YEAR ONE	$ 31,835	$ 31,835	$100,970	$100,970
YEAR TWO	$ 31,835	$ 63,670	$ 9,421	$110,391
YEAR THREE	$ 31,835	$ 95,505	$ 9,421	$119,812
YEAR FOUR	$ 31,835	$127,340	$ 9,421	$129,233
YEAR FIVE	$ 31,835	$159,175	$ 9,421	$138,654

Over five years of automated system operation, the library will have spent $138,654. During the same period, they would have spent $159,175 in ongoing costs by keeping the manual system. This results in a savings of $20,521.

The intitial (first year) system costs, were $100,970, which results in an extra expense of approximately $69,135 in the first year. As you can see from the above table, the automated system will not save the library money until the fifth year.

This is one reason it is unwise to promote the system to your funding authorities based on the premise that you will save money. Much depends on the functionality desired and the size of the library. You may not save money. However, you can expect to contain rising costs.

You may be able to convince your funding authorities of the value of an automated system by explaining the following benefits, which are difficult to quantify or are unavailable with manual systems.

Collection Use Statistics

These can help library staff make more informed collection development decisions and, as a result, spend this money more wisely.

Public Relations

Staff will be used more efficiently. This is a chance to reorient staff from dealing with paperwork to dealing with the public.

Automation Appeal

Technology that has been implemented in the library usually raises both the visibility and the usefulness of the library.

Collection Access

Shelf status for all materials is provided immediately for patrons via the public access catalog, eliminating wasted time searching for specific items.

The searching of the public access catalog is both more powerful and flexible.

DETAIL OF COSTS

HARDWARE

File Server

IBM 486 or compatible computer		
4 MB RAM		
600 MB Hard Drive		
525 MB Tape Backup		
Uninterruptible Power Supply		
SCSI Controller		
Modem		
	$15,151	

Workstations (8)

IBM 386 or compatible computer		
2 MB RAM		
80 MB Hard Drive		
3 1/2" and 5 1/4" Disk Drives		
DOS 5.0		
VGA Color Monitor		
$1,349 each	$10,792	
Maintenance on file server and workstations -- $680/year		

Peripherals

Laser Printer	$ 630	
Public Access Catalog Printer (3)		
$600 each	$ 1,800	
Barcode Readers (2)		
$600 each	$ 1,200	
Portable Inventory Barcode Reader and Back-up Unit	$ 950	
Maintenance for Peripherals -- $450/year		
		$30,523

SOFTWARE

Circulation/Public Access Catalog/Cataloging	$6,800	
Maintenance -- $288/year		
Software Port License $8,000		
Maintenance -- $800/year		
Dial-in Softwre	$1,000	
		$15,800

SITE PREPARATION

Install 30 Amp Electrical Circuits		
9 locations @ $200 each	$1,800	
Cabling	$2,000	
Electric Bill		

Assume each computer uses 300 watts per hour; each computer runs 12 hours per day, 300 days per year; at $0.06 per kilowatt hour:

300 watts/computer x 9 computers = 2,700 watts
2,700 watts/hour x 12 hours/day = 32,400 watts/day
32,400 watts/day x 300 days/year = 9,720,000 watts/year

$$\frac{\underline{9{,}720{,}000 \text{ watts/year}}}{1{,}000 \text{ watts/kilowatt}} = 9{,}720 \text{ kilowatts}$$

9,720 kilowatts x $.06/kilowatt	$ 583	
Maintenance -- $583/year		
		$4,383

DATA CONVERSION

The vendor will sub-contract this work to a data conversion vendor; the library will receive USMARC bibliographic records for all materials and a smart barcode label for each item

$.50/title x 40,000 titles	$20,000
$45/1,000 items	$ 1,800
$1000 set-up fee	$ 1,000

Patron Conversion

Staff enters 18,000 patrons @ 40 per hour @ $5 per hour	$ 2,250	
New patron cards were purchased which include the barcode embedded in the plastic card		
$.50/card for 18,000 patrons	$ 9,000	
		$34,050

TRAINING

Service and Support		
Installation		
Consultation		
Training	$ 9,488	
Attendance at annual users' group meeting		
$500		
		$ 9,488

SUPPLIES

Dumb Barcode Labels for Items		
$32/1,000 for 10,000 items	$ 320	
Annual Cost -- $320		
Barcode Label Protectors		
$29/1,000 for 15,000 items	$ 290	
Annual Cost -- $290		
Continuous Spine Labels		
$35/5,000 for 10,000 items	$ 70	
Annual Cost -- $70		
3 1/2" Diskettes		
$19/10 for 80 diskettes	$ 152	
Annual Cost -- $152		
Computer Paper		
$24/box for 12 boxes	$ 288	
Annual Cost -- $288		
Surge Protectors		
$57/each for 8 protectors	$ 456	
Fire Extinguisher	$ 150	
		$1,726

ADMINISTRATION

Approximately 10 hours per week, or about 500 hours annually, is necessary to maintain and upgrade the automated system.

500 hours x $10/hour	$5,000	
		$5,000

CIRCULATION MAINTENANCE

Card Filing

The library circulation clerk can file and unfile 4 cards per minute, or 240 per hour. With 200,000 annual circulation transactions, 400,000 cards are filed per year. Divide 400,000 cards by 240 cards per hour, then multiply the result by the clerk's wage.

$$\frac{400{,}000\text{ cards}}{240\text{ cards/hour}} = 1{,}667\text{ hours}$$

$$1{,}667\text{ hours} \times \$5.00\text{/hour} = \$8{,}335$$

$8,335 annually has been saved.

Overdues Production

The circulation clerk types 20 notices per hour. Based on a 3 percent overdue rate, 6,000 notices are typed annually.

$$\frac{6{,}000\text{ notices}}{20\text{ notices/hour}} = 300\text{ hours}$$

Each patron averaged 2 notices per envelope, so 3,000 envelopes were stuffed and stamped at a rate of 120 per hour.

$$\frac{3{,}000\text{ envelopes}}{120\text{ envelopes/hour}} = 25\text{ hours}$$

Therefore, the total overdue processing was 204 hours.

$$(300\text{ hours} + 25\text{ hours}) = 325\text{ hours}$$
$$325\text{ hours} \times \$5.00\text{ per hour} = \$1{,}625$$

$1,625 annually has been saved.

Monthly Statistics

Monthly circulation statistics reports required approximately 4 hours for the librarian to compile, or 48 hours per year.

48 hours x $10.00/hour = $480

$480 annually has been saved.

Inventory Report

The librarian and two clerks compiled the inventory one month over the summer. They spend approximately 170 hours on the inventory.

(170 hours x $10.00/hour) + (340 hours x $5.00/hour) =

$1,700 + $1,700 = $3,400

$3,400 annually has been saved.

CARD CATALOG MAINTENANCE

Card Filing

The librarian filed an average of 2 cards per minute, or 120 per hour. The library adds 5,000 titles per year. Each card set averages 5 cards, so 25,000 cards are filed annually. Divide 25,000 cards by 120 cards per hour to determine the number of hours needed.

$$\frac{\text{25,000 cards}}{\text{120 cards/hour}} = \text{208 hours}$$

208 hours x $10/hour = $2,080

$2,080 annually has been saved.

Catalog Card Production

The librarian cataloged the materials and typed the main entry catalog card at a rate of one every 10 minutes, or 6 per hour. The clerk then photocopied the card and typed the remaining added entry cards at a rate of one every 5 minutes, or 12 per hour.

Librarian: $$\frac{\text{5,000 titles}}{\text{6 titles/hour}} = \text{833 hours}$$

833 hours x $10/hour = $8,330

Clerk: $\frac{5{,}000 \text{ titles}}{12 \text{ titles/hour}} = 417 \text{ hours}$

417 hours x $5/hour = $2,085

Cards: 5,000 titles x 5 cards/title = 25,000 cards
25,000 cards x $20/thousand = $500

$8,330 + $2,085 + $500 = $10,915

$10,915 annually has been saved.

ADMINISTRATION

The librarian spends about 10 hours per week, or about 500 hours annually, in supervision and management duties relating specifically to manual the circulation and card catalog processes.

500 hours x $10/hour = $5,000

$5,000 annually has been saved.

Appendix F

THE PROPER TRAINING APPROACH FOR ADULTS: IT IS REALLY DIFFERENT...ISN'T IT?

If one has been exposed to basic courses in education or educational psychology, one quickly hears that the training of adults is very different from that of children. There are many studies advocating this traditional "andragogist" theory. It states that adults are not dependent upon a trainer in the same way that children are dependent upon a teacher. Adults have had a lifetime of experience upon which to judge and relate to the material which is presented to them for learning. They are normally being trained for not only a grade or a degree, but also for self-development, problem-solving skills, or other more specific goals. The trainer of adults must therefore accommodate the knowledge already possessed by the trainees, and recognize that adult instruction must be much more participatory, relevant, and capable of additional control by the trainees themselves.

Before the development of andragogist theory, renowned psychologists like Carl Rogers advocated the principle that each adult learner had a responsibility for his/her own learning and the creation of the climate for encouraging it. John Dewey called this "learning by doing."

Lately, some of the andragogists have begun to suggest that this adult theory of learning might be extended to children, simply because they will eventually grow up and have their own problems to solve. This education approach would provide children with the framework for learning how to function in the adult world, and it would provide this education before all of the adult prejudices and experiences have had the chance to rigidify their thinking.

Taking this concept a bit further, Ashley Montagu, in his 1981 book *Thinking Young*, espoused the concept of neotany, or the retention of juvenile traits into adulthood. In short, he postulated that many desirable learning capabilities diminished with age. These included playfulness, imagination, honesty and trust, open-mindedness, and explorativeness. Jean Piaget also supported this concept, indicating that teaching methods played a very limited role in actual learning. The child is his/her own best teacher.

These education theories, then, can almost become contradictory. One says that adults need training based on the concept that they are more capable of independent thought and therefore require more latitude in determining how they will be trained. Another indicates that children are best able to determine their training methods because adults have lost learning flexibility. Nevertheless, one must consider that there is still a dependency relationship somewhere in the equation; perhaps it is in the transparencies that are used, or in the computer-aided instructional prompts that continually stroke the adult trainee with child-like phrases like, "very good, Jim Smith!"

Why is all this theory relevant to training packages for automated systems? The reason is that there is not yet a "unified theory" regarding the best method of adult education. In fact, there may never be agreement on how people actually learn. There are different methods which are equally effective for different learners and in different settings. The goal of this discussion is to show that:

1. the responsibility of the trainers in preparing their training packages for library automated systems is to know which methods work in a particular situation, and;

2. the choice of educational method and content is best determined by an examination of the library automation environment, the life experience brought to the workplace by those who are being trained, and the advantages and disadvantages of the various training methods/packages at the trainer's disposal.

Library Automation Environment

Although this particular topic is a very broad one, there are three important areas that make library automation considerably different from other management, governmental, and institutional data processing environments. All of these factors have considerable impact upon the way that staff are taught.

First, typical library systems have very large files, very large records within them, and complex access to these records. This difference is nothing very new; libraries have been involved with the systematic science of information storage and retrieval long before computers were invented. All of the currently available paper tools illustrate the history of the development of the relevant system functional specifications: Library of Congress cataloging, Dewey Decimal Classification system, *Anglo-American Cataloging Rules*, ALA Rules for Filing. To illustrate the scale of library system complexity compared with other system types, one might consider a municipal utilities billing system. Its records have approximately 500 characters and four access points, e.g., customer name, account number, billing address, service address. This can be contrasted with an integrated library system. The typical disk space for a single MARC bibliographic record, including the indexing, often exceeds 8,000 characters of information with almost unlimited access points. Often there is keyword access combined with Boolean operators across author, title, subject, series, and notes fields. This implies that the training for the optimal use of this system will be considerably longer, more complex, and will require extra time for staff to practice their searching skills.

Second, the library system user base incorporates an extremely wide latitude of automated systems familiarity. With most other governmentally-operated systems, there is an assumption of the eventual skill levels of the user based on the user's job description. In contrast, the library automated system will have direct public contact. This implies that the system must be more complex and flexible in order to adjust to the necessary user-defined skill levels, from a menu-driven approach through a complex command-driven interface. The system must also be able to provide the appropriate context-sensitive help required to increase the operational skills of each user. Moreover, library staff must be able to provide the necessary help to the public, and this further complicates the training process. Not only are the staff expected to optimize their own use of the system, but also they will have to learn how to teach others with highly diverse skill levels to do the same.

Third, library computer use training is different from other kinds of library training. There are considerable time and space constraints. Sometimes administrators can be unrealistically optimistic concerning the amount of time required to train the staff in order to make the system operational, particularly if they too heavily base their estimates on vendor optimism. At first, the staff must have adequate opportunity to learn the complex set of functional options afforded by an integrated library automated system, and how these capabilities fit into current and future library operations. This problem is further exacerbated due to location and scheduling difficulties provided by the computer itself. Sometimes it is difficult for a trainee to have convenient access to a workstation in order to practice as needed.

Life Experiences Of Those Being Trained

People bring past experiences with computers, some of which are problematic. These can interfere with effective training, and therefore the trainer has to create positive experiences. Some staff members believe that computers are evil, independently-willed entities capable of serious harm. Some think that computers are stupid devices that only do what they are told, and are therefore either capable of incredible mistakes, or are difficult to use. Others have been intimidated by the current rash of mass media advertising in which technical terms are deliberately tossed around without explanation. Conversely, some staff believe that the computer can solve all of their work-related problems.

Other people have very emotional responses to computers. Staff fear that they may look foolish if they make a mistake using one, particularly when there are varying levels of computer literacy among the staff. Many think that computers are very fragile and can be broken by a single incorrect keystroke. Others fear the computer's potential intrusion into society, or that the computer has been installed in order to eliminate their jobs.

Regardless of the actual training method, there are counter-measures for each of these problems. The staff needs to recognize that the computer is merely a powerful tool which will help them to do their work better and more easily, eliminate some of their more labor-intensive tasks and thereby free them for other work, and provide to the library additional currently unavailable information which will improve library services. The system is designed to be able to anticipate some of their mistakes and to take corrective action. It is not fragile and the daily tasks that staff perform cannot cause the computer to break. The system is designed to allow users sufficient capability to accomplish their work, yet contains password security to assure that they cannot access functions that could inadvertently cause serious harm. The staff will be properly trained in the jobs that they will perform. They do not need to learn complex mathematical skills or learn to program, any more than they need to become an auto mechanic in order to drive their cars. Staff need not fear that the system will eliminate their jobs. The universal experience of libraries is that these systems do not reduce staff. Typically the computer creates new jobs, provides some level of cost containment, and causes some job reassignments. Finally, they need the assurance that library systems have been successfully implemented elsewhere, and therefore the same will occur locally.

There are a number of concerns which apply to all training methods, and especially for computer system training. To achieve maximum effectiveness, each must be accommodated.

Concentration, Tension, and Fatigue

Computer training causes tension because it requires a high level of concentration. Because tension is tiring and interferes with learning, it is necessary to adjust for this fatigue.

There are limits to the amount of time that a student can concentrate, regardless of the interest in the material. Many educators estimate that this is about one and one-half hours, under the best of circumstances. Certain times of the day can reduce this time limit. Morning is usually the best time, and just after lunch is generally the worst. Late in the day carries the disadvantage of mental distractions associated with unfinished daily business or the transition back to personal lives.

The instructor can reduce the tension by varying the training techniques, and by injecting humor or personal experience into the discussion. One must be careful not to overutilize these methods, however. Too much variation can become distracting or confusing, and excessive use of humor or personal experience can waste valuable training time.

An additional cause of tension is the logistical changes that might be required for the educational setting, especially when changing training methods. Rearranging the room, shifting furniture, and hardware problems detract from the learning experience. A better approach might be to have several prearranged settings, and to assure in advance that all hardware is operational.

It is helpful to bolster the trainees by stating the personal and job-related benefits associated with this training. These include not only the improved productivity, but also the new marketable skills that they will learn.

Students will need some additional reassurance regarding the usual initial difficulties that they might encounter with basic information. It is very important for the trainer to communicate that there are no "stupid" questions, only stupid answers. It is necessary to encourage questions so that no one lacks the necessary information in order to proceed with the training. It would be helpful to reassure the trainees of the value of questions. Chances are excellent that if a question arose in the mind of one trainee, it also occurred to others. By asking the question, the entire group gleans the benefit. The trainer must recognize the ultimate limits on the amount of information that can be communicated within a given time limit. This is not always easy to do, and it requires constant observation of the audience. The trainer can demonstrate great sensitivity by calling a two-minute stretch break, even if it interrupts training.

The Audience to Be Trained

Everyone who uses the system will have to be trained, although the training would be appropriate to each person's job responsibilities. This training would therefore include computer operations staff, librarians, para-professionals, clerical assistants, and administrative staff. Although all staff eventually must be trained, it is necessary to establish a training prioritization. Obviously the computer operations staff will need the initial training. For example, a larger library installing a circulation control system would also have designated circulation department staff, and it would be best to train them before others. In many academic libraries, however, the public access catalog is often the first operational module, and the reference staff might be the priority group for training. Other libraries might decide that technical processing staff would be first.

Training Content, Scheduling, and Evaluation Feedback

Although this is attuned to the individual's job duties and what the patrons might need to know to operate the system, there are a number of topics that the training can address.

History and development of the system; local library history; vendor history
Computer operation, function keys, editing keys
Overall system operation
Searching methods
Interpretation of system responses
Scope of the system database
Error reporting methodology

For each training session, the following elements should be present:

Session training objectives
Procedural instructions
White space in all paper training materials for notes
Self-test sessions

Especially in the beginning, training plans must incorporate the considerable overhead of training all current library staff. The trainers must account for the number of hours, as well as limitations on training facilities in order to be able to prepare all of the library staff adequately. Nevertheless, the trainers must also build into the training operations the necessary accommodation for the ongoing training for new library staff.

It is also critical to evaluate the training to see that it meets its objectives, and if the objectives themselves are appropriate. Evaluation techniques do not need to be extensive, but follow-up research is important to determine exactly how the training met the day-to-day interactions with the system.

Appendix G

LOCAL AREA NETWORKS

What is a local area network?
Why should libraries be bothered with them?
What purpose do they serve for library automation?

A local area network, or a LAN, allows resources to be shared by those connected to the network. These resources can include printers, CD-ROM players, software and information. In this manual, the emphasis will be on sharing information; specifically, sharing library-related information.

At its lowest level, a LAN is no more than a computer which is connected to workstations by cabling. In most cases, the bibliographic information and library automation software are loaded onto the file server. The file server is usually the most powerful computer in the LAN. The workstations retrieve information from the file server to be presented to the patron or staff member.

Following is a brief discussion of the basic parts of a LAN. This is general information. Your automated library system vendor will be able to provide much more specific information.

OPERATING SYSTEMS

The LAN operating system serves the same purpose as the operating system of your microcomputer. It provides file management, data transmission, printer spooling, and message transmission. File management assures that files stored on the file server are made available to the appropriate users. For example, the public access catalog information should be made available to any user; however, patron information should be made available only to specific circulation staff. Data transmission is the ability to move files from the file server to the workstation, or vice versa. Message transmission is the ability to send a message to any user who is currently logged on. Printer spooling involves sending the print jobs to the correct printer and storing the content of print jobs on their way to a printer.

There are four basic "types" of operating systems:

DOS-compatible
Appletalk-compatible
UNIX
OS/2

The automated library system vendor chosen will determine which type of operating system will be used. There are a number of well-known vendors which support each type of system. For example, Novell, Microsoft, and LANtastic are some brand names associated with the DOS-compatible type. Macintosh is the primary vendor for the Appletalk-compatible type. Banyan Vines is the primary vendor for UNIX. Both IBM and Microsoft support the OS/2 type.

HARDWARE

Hardware for a LAN will normally include:

File Server
Hard Disk Drives
Workstations
LAN Interface Cards
Printer
Uninterruptible Power Supply
Tape Backup System
Security Devices
Microcomputer Toolkit

File Server

This is normally the most powerful computer in the LAN. It, therefore, requires a large amount of memory and a sizable hard disk. At this time, a minimum of a 486 processor is recommended and at least 2 MB of RAM. Your vendor may modify this configuration for your specific installation.

Hard Disk Drives

Your bibliographic data will reside on the hard disk drives. Therefore, it is very important to purchase the correct size. The automated library system vendor can help in determing the correct size. Remember, however, that your determination should take into consideration the library's growth over the next five years. Do not purchase a hard disk drive to house the current number of records, but the projected number. At this time, a minimum of a 120 MB hard disk drive is recommended for the file server.

Workstations

The choice of workstations is mainly dependent upon the type of work to be done at each workstation. For example, will information be downloaded? Then, at least one disk drive will be necessary. Does the automated system make use of color? Then, color monitors might be desirable. Will a pointing device be necessary? Then, a mouse should be purchased. Will information need to be stored on the hard disk drive and, if so, how much? With this type of information, purchase workstations with hard disk drives with sufficient space.

LAN Interface Cards

In order to connect a microcomputer to a LAN, most require an interface card. The type of card is dictated by the LAN chosen and by the type of bus used in the microcomputer.

Printer

This printer is connected to the LAN, and has the ability to receive print requests from other workstations on the LAN. If only the ability to print screens from a single workstation is desired, then a slave printer can be directly attached to the workstation. A printer on a LAN can provide printing capability for a number of public access catalog workstations; or all circulation workstations can print receipts, overdue notices, or bills on a single LAN printer. More than one printer may be desirable. Some printers are available LAN-ready, that is, with a built-in LAN interface.

Uninterruptible Power Supply

If information has not been stored by the file server, then a loss of power, however small, could cause either damage or loss. An uninterruptible power supply (UPS) allows power to continue flowing to the system so the files and the file server can be shutdown correctly. It acts as a backup generator by supplying constant power for a specific amount of time. Some UPSs offer an automatic shutdown, whereby a message is sent to all workstations stating that the system will be taken down and, after an allotted amount of time, proceeds to close all files and shut the file server down.

Tape Backup Systems

Scheduled, frequent backups of data is a necessity. The tape backup used should be at least as large as the hard disk drive of the file server. Use of Digital Tape Drives (DAT) is recommended for backing up LANs. Be sure a schedule for backing up data is followed. A recommended backup schedule for full backups can be as follows:

Day 1:	Backup system with Tape A; house Tape A in the library;
Day 2:	Backup system with Tape B; house Tape B in the library; house Tape A at home;
Day 3:	Backup system with Tape C; house Tape C in the library; house Tape B at home; house Tape A in nearby office building (post office, bank);
Day 4:	Backup system with Tape A; house Tape A in the library; house Tape C at home; house Tape B in nearby office building.

	DAY ONE	DAY TWO	DAY THREE	DAY FOUR	DAY FIVE	DAY SIX	DAY SEVEN
LIBRARY	TAPE A	TAPE B	TAPE C	TAPE A	TAPE B	TAPE C	TAPE A
HOME		TAPE A	TAPE B	TAPE C	TAPE A	TAPE B	TAPE C
OFFICE			TAPE A	TAPE B	TAPE C	TAPE A	TAPE B

Continue with this schedule, rotating the three tapes daily. If one tape is lost or destroyed, there are two other recent copies which can be used to restore the data. The locations used to house the tapes are, to an extent, irrelevant. Just be sure the three locations are separate.

Backups can also be done incrementally. It is possible to make a full backup weekly or monthly and make incremental backups daily. Incremental backups include information added, deleted, or modified that day. Be sure, however, that there are two copies of the full backup and that they are stored in separate places.

Security Devices

Physical security of the hardware may be necessary, particularly if workstations are available to the public. File servers should be housed in an area inaccessible to the public. Public workstations may be anchored to the tables with cables, bolts, or padlocks. Security devices for mouses and keyboards are now also available.

Microcomputer Toolkit

Many parts of the microcomputer are too small for ordinary tools. Even if you don't plan to make a habit of fixing your own microcomputers, a toolkit will most likely come in handy the few times it is necessary to make minor changes.

WIRING

It is possible to wire a LAN yourself. If you have had little experience with computers and LANs, it is recommended that either the automated library system vendor wire the LAN or a local network consultant or company do the work.

There are a number of types of "topologies." A topology is the pattern of wires used to connect the workstations and the file server. For example, in a "ring" topology the workstations and the file server are connected in a circle. In a "star" topology the file server serves as the central point, and each workstation is connected directly to it, creating the impression of a star. In a "bus" topology a central cable is laid and each workstation and file server is connected directly to the central cable. Today, it is normal to see topologies which are mixed. For example, mixing a "star" and a "ring" might produce a number of "star" topologies which are connected in a "ring."

The type of cabling must match the topology of the LAN (e.g., Ethernet, Token Ring). There are three basic types of cabling: twisted pair, coaxial cable, and fiber optic cable. Twisted pair is much like telephone wire. Inside the sheath are wires which are twisted in pairs. The sheath can be shielded or unshielded, depending upon the amount of electrical interference nearby. Coaxial cable has a metal wire conductor running through plastic and braided shielding. Fiber optic cabling has a plastic or glass conductor, through which light transmits information.

OPERATIONS

A LAN requires attention, even though most are relatively stable. It is very helpful if one person can be designated the "LAN Manager." This person will support, manage, and upgrade the LAN. Some of the duties of a LAN Manager include:

Setting up and deleting accounts;
Configuring and upgrading workstations for users;
Upgrading software and/or hardware;
Allocating disk storage space for users;
Reviewing and modifying security;
Tracking usage of the network;
Backing up data.

Appendix H

GLOSSARY OF MICROCOMPUTER TERMS

Access Point

A piece of information that can be retrieved from a file in a database. Typical access points in bibliographic files include author, title, subject, call number, and ISBN.

Ampere (Amp)

A measure of electrical current per unit time, literally the number of actual electrons passing through an electrical circuit in a given amount of time. The amount of incurred amperage, not voltage, determines the extent of damage from exposure to electrical current.

Analog

Data communicated using tones. See Telephone Line, Analog.

***Anglo-American Cataloging Rules* (AACR2)**

AACR2 relates to the *Anglo-American Cataloging Rules*, second edition, revised 1988. As a way to implement standardization in cataloging formats, American, British, and Canadian libraries agreed to these rules. Many librarians are now able to catalog various formats of library materials from books to musical scores in similar ways throughout the world.

Authorized Terminal Operator

An individual system user who has access to certain functions, as permitted by the security control component of that system.

BPS

Bits Per Second. This is the rate at which the data flows, or can flow, through a data communication medium, typically a modem or a telecommunications data line. Modems typically have bps rates of 300, 1200, 2400, 4800, and 9600. Data lines are usually quoted in terms of KBPS, or kilobits per second. This is merely the above-mentioned numbers divided by 1,000, i.e., 0.3 kbps, 1.2 kbps, 2.4 kbps, 4.8 kbps, and 9.6 kbps.

Backup

1. An archival copy of the system software and the work that has been done on a system. A backup is normally done via a tape drive, since floppy disk back-up takes so long that the expense of the tape drive is justified. Having a current back-up of your system stored in a safe place can save you numerous hours of desperation and nightmares if the system is ever struck by lightning, or "crashes."

2. An alternative to the automated system. In many larger systems, libraries will purchase a microcomputer to handle circulation in the event the minicomputer fails. For a microcomputer-based system, most libraries use a manual system as a backup.

Barcode Reader

A device utilized for reading barcode labels. One type resembles a pen with a laser beam emanating from one end (light pen) and another resembles a gun (laser gun). In either case, the laser beam rubs or reads the symbol on the barcode. They can be either directly attached to the microcomputer, or may be installed on a data recording device whose information can be later interfaced to the computer system.

Baud

The number of signal transitions per period of time on the phone line. This term is usually used to mean the same thing as bps. This is incorrect, however, because more than one bit per second can be contained in one baud. Rather than using the term baud when speaking about the speed of data transfer, the expression bps should be used.

Bibliographic Record

Information contained in a title record or USMARC record.

Bibliographic Utility

An database which provides bibliographic information for cataloging and other library uses. Also refers to the suppliers of such databases, as well as the databases themselves. Examples of bibliographic utilities include OCLC, RLIN, WLN, BiblioFile, and LaserQuest.

Bibliographic Interface

Hardware and software which allows data to be transferred from the bibliographic utility to the local library automation system.

Binary

Information characterization communicated by one of two choices: yes or no; presence or absence; right or left; up or down.

Bit

Short for binary digit and represented by either 0 or 1. Typically the smallest representation of information in computers, consisting of either the presence or absence of an electrical signal.

Block

A system-generated prohibition against further processing of the current transaction. A patron block can result from an attempt to charge items to a patron who is delinquent. An item block can result from an attempt to charge an item to a patron who is unauthorized to borrow materials of that material type.

Boolean Search

A search strategy for selected information that uses AND, OR and NOT expressions. For example, to find a book about using computers in libraries, you could search: "libraries" AND "computers."

Bugs

See Software Bugs

Bus

A channel or path for transferring data and electrical signals.

Byte

One character of information digitally represented. Usually one byte is represented by approximately 8 bits.

Cabling

The physical wires connecting different system components to each other. There are three types of cabling: twisted pair, coaxial, and fiber optic. Twisted pair is slower, simpler, and best for voice grade transmissions. It is most commonly used for telephones, and small local area networks. Coaxial is the type of cabling used for cable television. It can carry large amounts of data and is not easily affected by interference. Fiber optic uses glass to conduct light which was converted from electrical signals. This can carry much more information with greater security, but usually at a higher price.

Call Number

The set of symbols identifying a particular item in a library collection and indicating its location. Usually includes a subject classification number and a book number or letters of the author's surname.

CD-ROM

The abbreviation for Compact Disc/Read-Only Memory. This data storage format is read by laser, and stores about 550 megabytes of information. The data stored on this disc can only be read, and never erased or overwritten. Libraries use CD-ROM products for cataloging, union catalogs, and reference databases.

Charge

Also known as check-out, this is a circulation process by which an item is assigned to a patron for a specific time period. Normally the system status of the item becomes "charged," and includes the due date.

Check-in

See Discharge

Check-out

See Charge

Console

In a larger computer system, this is the special terminal that is the master controller of the system. On older systems, it is a printer with a keyboard attached. In microcomputer systems, the keyboard is the console.

Daisy Wheel Printer

A type of printer that most closely resembles a typewriter. The letters are fully formed like the raised letters on a rubber stamp. They are located on the ends of long finger-like projections that look like the petals on a daisy.

Database

An organized collection of computer records, standardized in format and content, that is stored in any of a variety of computer-readable modes. It is the basic set of data from which computer-readable files are created.

Default

The standard value that the system automatically enters into a data field when the user does not enter a value into that field. An example is the system entering today's date when an item is discharged.

Delinquency Threshold

A pre-assigned limit which, when exceeded, will change the patron borrower status from "unblocked" to "blocked," thereby prohibiting the patron from borrowing additional library materials. Library automated systems can have several different types of delinquency thresholds for each patron type: number of overdue items, number of charged items, amount of fines owed.

Digital

Data communicated using binary. See Telephone Line, Digital.

Discharge

Also called check-in, a circulation control process that reverses the charge function. Typically the system compares the due date with the discharge date, and if the item is overdue, the associated fine is calculated and added to the patron's account. If the item is not overdue, all links between the item and the patron who charged it are normally broken.

Disk Drive

A data storage device that contains a series of circular platters or disks which are coated with iron oxide. Disk drives are available in two general technologies: floppy and hard.

Dot Matrix Printer

A printer that constructs letters by aligning a series of dots. These dots are created by a series of vertically-aligned pins contained in the print head. Typical dot matrix printers now have at least nine pins, and some have as many as twenty-four. Usually, the higher the number of pins, the higher the quality of printing.

Due Date

An assigned date and/or time for a specific item to be returned to the library, after which overdue fines may accrue to the patron. The due date can be assigned automatically by the system, although many systems permit the terminal operator to assign an alternative due date manually.

Dumb Terminals

See Terminals, Dumb

False Hit

A record that appears to the computer to meet the search qualifications but which does not really reflect what you want. For example, by entering a search for "Wind," you assume you will get some fairy tales about North Wind. You retrieve:

1. The Old North Wind
2. Violins and Other Wind Instruments

While #1 is just what you wanted, #2 is a "false hit" or "false drop" - a term that technically fulfills your requirements but is not what you wanted.

File Server

Usually the most powerful computer in a local area network. It makes files, print, and communications services available to other computers on the LAN.

Fine

A monetary charge which accrues to a patron resulting from violation of library rules. Fines can be assessed either automatically by the system, or manually by the terminal operator.

Floppy Disk

See Disk Drives

Flow Chart

A diagram that uses symbols and interconnecting lines to show the logic and sequence of specific program operations. The symbols are filled in with the task or product (depending on the symbol) and the lines indicate a flow of activity. The symbols are a diamond (decision indicator), a circle (a connector symbol that is a sign of continuation of the flowchart), a parallelogram (input/output symbol meaning the input to a certain procedure or output from it), a rectangle (a processing symbol to indicate that a process is being carried on at this point like a calculation or a checkout), or an oval (a terminator symbol used to indicate the beginning or end of the flowchart). These can be very helpful in illustrating a process.

Functional Specifications

Detailed listing of the features and capabilities a local library desires in an automated system.

Gigabyte

1,024 megabytes of information, approximately one billion characters, often represented by the letters "GB" or "gb." Larger library systems can contain about 150,000 MARC records in one gigabyte of disk storage, or the entire text of a personal library collection of about 1,000 volumes. The sizes of larger magnetic data storage disk clusters are often represented in terms of gigabytes.

Goals

Long range, broad, general statements describing a desired condition or future toward which the library will work during the next period of time.

HALON

A fire extinguisher chemical that was used in the vicinity of computers. Halon leaves a relatively minor residue, compared with carbon dioxide and other dry chemicals, which can harm electrical components.

Hard Disk

See Disk Drive

Hardware

The electrical and mechanical equipment of a system, including printers, computers, and barcode readers.

Hit

A record that meets the qualifications specified in a search. For example, a subject search for "Texas" would probably result in a large number of books being found. You would therefore have a large number of hits.

Holds

The process by which an authorized terminal operator or patron may place a message in the system to indicate that upon discharge (or charge), that item is to be set aside for that patron.

Implementation

That section of the automation project process that includes site preparation, patron registration, barcode labeling, and system installation. This includes everything after purchasing the system until it is up and functioning.

Interface

The media and means through which disparate systems communicate. Two systems which have a tape interface imply that data on System A's tape output can be loaded directly to System B. Other interfaces include direct (i.e., a physical cable), and visual (usually refers to the interaction between the human terminal operator and the system).

Invitation to Bid (ITB)

A document issued to vendors that outlines the local automation project and lists all requirements of a local system. Vendors respond with a firm bid addressing the issues specified. In most cases, if all the stated requirements are not met, the bid is "thrown out" or disregarded. Compare with Request for Proposal.

International Standard Book Number (ISBN)

A number given to a book before publication as a means of identifying it concisely, uniquely and unambiguously. This numbering system is administered among cooperating publishers in participating countries.

International Standard Serial Number (ISSN)

A unique identification number given to a serial title.

Item

A unique piece of library material as identified to the system, usually by a barcode number. Whereas the bibliographic information is often called a "title," each copy of that title is an item.

Item Data Entry/Update

The furnishing of information about specific pieces of the library collection to the library automated system. Depending upon the individual system, this information may be keystroked, it may be entered via disk or tape, or it may be directly loaded via cable from a bibliographic utility. Item data update is the modification or expansion of pre-existing information in the library automated system.

Typical item-specific information includes: unique system identification number, owning location, temporary circulating location, fine accrual rate, non-circulating indicator, statistical count category.

Item Inquiry

The process of requesting and receiving information regarding a specific piece in the database via the allowable access points. Typical access points include combinations, either partial or full, of the following: call number, unique system identification number, owning location, temporary circulating location, fine accrual rate, non-circulating indicator, and statistical count category.

Jobber

A dealer who buys from publishers and sells to libraries and bookstores. Synonymous with wholesaler and vendor.

Kilobyte

About one thousand bytes of information, often represented by the letter "K." This is the amount of data on one typewritten page. Small magnetic data storage disks are often represented in terms of K.

LAN

See Local Area Network

Laser Printer

Printer technology that uses a laser to scan and position the individual dots on the printed page. Location of the printed dots is very finely defined, often 300 dots per inch or more. The output from a laser printer is therefore very high quality. The type on this page was originally produced by a laser printer. The mechanism that actually produces the printed output is similar to a photocopier and therefore the output of the printed pages can be quite swift.

Laser Scanner

A specific type of barcode reader. Instead of stroking, the laser performs the lateral movement across the machine-readable label. The major advantage of the laser is that the laser scans very rapidly, often 100 times per second. This rapidly repeating scanning results in almost instantaneously successful label reads. The second advantage is that there is no physical contact between the scanner and the label. This greatly extends label life, and can permit the library to use unlaminated labels, which are less expensive.

Library of Congress Control Number (LCCN)

A system developed and used by the Library of Congress which provides a unique number for each title they own. This is not the same as the Library of Congress call number.

Light Wand

See Barcode Reader

Local Area Network (LAN)

A set of automation components, usually workstation computers, larger file server computers, and printers, which are electronically connected to each other by special wiring, circuit boards, and software. These components are not usually connected to the telephone company, although the data may pass through the building through the same internal cabling that connects the telephone instruments. Examples of LANs include Appletalk, Novell, and LANtastic.

Long Range Plan

A document that identifies a long term (normally at least five-year) course of action aimed to effectively produce desired results. In the case of a long range automation plan, a library seeks to identify their needs and determine solutions for the next five years.

Magnetic Tape

A tape of any material coated with magnetic particles, on which audio and video signals and digital data can be recorded.

MARC

See USMARC.

MUX

See Multiplexor

Mainframe Computer

Usually a very large and powerful computer which executes the instructions sent from the terminals attached to it.

Material Type

In a bibliographic record, this is sometimes known as the media code or material format. USMARC has defined 7 media formats: monographs, serials, musical scores, sound recordings, archival records, audiovisual media, and machine-readable data files. In an automated library system, the material type may determine the length of time that it may be borrowed.

Megabyte

About one thousand kilobytes of information, approximately one million characters. This is the amount of data stored on one thousand typewritten pages. In a small library system, one megabyte of disk storage could contain approximately 500 MARC records. The term is often represented by the letters "MB" or "mb." The sizes of random access memory (RAM), and larger magnetic data storage disks are often represented in terms of megabytes.

Microcomputer

A small programmable computer with a limited ability to handle mass storage and other peripheral equipment, often designed to handle a restricted number of applications.

Milestone

A major task on the library automation timeline which has the effect of delaying all other activities until it is completed. For example, if the site is not prepared in time, installation of equipment cannot take place, nor any further implementation.

Minicomputer

A relatively inexpensive mainframe computer. It is built for simple installation and does not require a closely controlled environment.

Mission Statement

A concise expression of the library's purpose that specifies the fundamental reasons for the library's existence.

Modem

A device which permits a digital device, like a computer, to communicate with another digital device via an analog medium, typically an analog telephone line. Modem is an abbreviation for a Modulator/Demodulator, because the digital signal must be modulated into an analog signal before transmission via the analog medium, and must be demodulated into a digital signal again before it can be understood by the receiving device. For this reason, modems must operate in pairs. An auto-answer modem is capable of turning itself on to answer an incoming request to communicate, and can adjust its data communication speed to match that of the incoming transmission. A dial-out, or auto-dial modem is typically capable of connecting itself to an outgoing analog telephone line, and dialing into a designated auto-answer modem.

Multiplexor

Also known as a MUX. A device much like a modem that permits many terminals or computers to be attached to a single phone line. The use of a MUX reduces telecommunication costs, though a MUX is much more expensive than a modem.

Needs Assessment

The identification of the problems and possible solutions to situations encountered in the library. This term is sometimes referred to as a "needs analysis" and can incorporate functional specifications.

Objectives

Short range descriptions of results to be achieved in a specific time period. Objectives should be measurable, viable, and time limited.

Online Public Access Catalog (OPAC)

See Public Access Catalog

Online System

Connection of computers to a central computer through a continuing communication hookup.

Operating System

The basic housekeeping software for a computer system. Typical functions of an operating system include the control of the system printer, monitor, disk drives and keyboards, placement of files, and the allocation of RAM. Some operating systems are DOS, MacIntosh, UNIX, and OS/2.

Override

Allows an authorized terminal operator to change a default. For example, if the default loan period for circulating a book is two weeks, the operator can override the due date to reflect a three week loan period.

Parameter File

The listing of the major decisions in the library automated system. Typical parameter file entries include patron delinquency thresholds, patron borrower types, item statistical categories, timing of overdue notices and other reports, and database access points.

Patron

A library user. A patron may or may not be registered. If a patron is registered in an automated library system, he has been assigned a borrower number, and ultimately must have all necessary personal information entered into the system.

Patron Borrower Status

A library automated system designator which indicates whether a patron may borrow library materials (usually "blocked" or "unblocked"). Typically a patron is blocked because the patron is not registered with the system or the patron is delinquent (has overdue books or an expired card).

Patron Borrower Type

A characteristic of a patron, as defined in the library automated system. Examples are adult, student, staff, or faculty.

Patron Data Entry/Update

The furnishing of information about patrons to the library automated system. Depending upon the individual system, this information may be keystroked, or it may be entered via disk or tape. Patron data can include such elements as name, mailing address, residence address, borrower status, and patron borrower type.

Patron Inquiry

The process of requesting and receiving information regarding a patron in the database via any of the allowable access points. Typical access points include the patron name, unique patron identifier, or the social security number.

Payments

A circulation control process which removes fines from a patron record by recording payment of money to the library. This is usually a manual process performed by a staff member.

Port

An electronic connection to a piece of data processing equipment. The term could refer to the actual physical connector plug, as well as the access to the system as a whole. Computers and multiplexors are two of many devices that contain ports.

Port Board

A circuit board that contains the actual physical plugs for the connection of other data processing devices. Sometimes port boards are called port expansion units, and these components typically contain anywhere from 8 to 32 ports.

Procurement

The process of examining and purchasing the automated system.

Public Access Catalog

A computerized card catalog with many additional features. Patrons will use this instead of the card catalog after an automated system has been implemented. Sometimes called a PAC.

Random Access Memory (RAM)

An area of a computer that holds data that it needs for immediate use. The computer can access this data more quickly than data stored on the disk drive, but the data on the drive is more permanent, or non-volatile. While the data is present in RAM, it is volatile. This means that if the electricity is disconnected from the RAM, the data will immediately disappear.

Report

A compilation and output of data from a computer. Reports can be either pre-formatted or custom-designed. A pre-formatted report can be supplied by the system vendor or be designed and stored for later use. Some systems have the ability to create custom-designed reports, and others provide only pre-formatted reports. Typical reports include circulation statistics, patron notices, and computer diagnostics.

Report Printer

A heavy-duty printer used for routine report and notice production, and for catalog card printing.

Request for Information (RFI)

A document sent to automation vendors that outlines the envisioned automation project, describes the local library and certain issues of local importance and requests an estimated budget for an automated system for the local library. Budgets given in response to an RFI are not binding and are to be used for planning purposes only.

Request for Proposal (RFP)

A document that outlines the local automation project, describes the local library and addresses all issues of local importance including contract requirements, functional specifications, hardware requirements, maintenance, support, and training. This is sent to the vendor and a binding proposal is returned. Though many options and specifications are requested, a proposal is normally not disregarded if a system cannot meet all of them, as all responses are not required to meet all specifications.

Reserves

See Holds

Response Time

The time it takes a computer system to react to a given input. It is normally measured to be the time between the touching of the "enter" or "return" key to the appearance of the first character of substantive data on the terminal screen.

Screen Printer

See Slave Printer.

Search Strategy

The search command types available to a system user. Also, a listing of the search commands used by a terminal operator. Examples of search strategies include: Boolean searching, keyword searching, and "author = twain".

Sears

An authority file of subject headings used by many small and medium-sized libraries. The full title is *Sears List of Subject Headings*.

Shared System

A computer system that is situated in one library and used by a remote location, normally via telephone lines. The information of the holdings of all libraries sharing the system are entered into the main database, however, each library may have the opportunity to set some local parameters to customize their system.

Shelflist

A catalog or items in a library collection arranged by call number.

Short List

Term used to refer to a subset of the universe of vendors. When you have looked at the field of vendors and narrowed down your choice to 3 or 4, you have a short list.

Slave Printer

A light-duty printer attached to a microcomputer, installed for the purpose of reproducing the information on the screen. Typical usage includes printing the search results from a public access catalog and printing short and infrequently generated reports.

Software

The programs, procedures, and documents that work with the hardware in a system.

Software Bug

A problem detected in a piece of software that results in unexpected behavior of the system. Some bugs only appear intermittently and can be difficult to document and correct. Bugs are normally corrected by a software fix or patch.

Software Fix

The solution to a problem or bug detected in a piece of software. A fix is sometimes also referred to as a software patch.

Software Upgrade

New features added to existing software. A software upgrade is normally added to a new release of software. While the new features may be wonderful, software upgrades sometimes require an expansion of existing hardware or they can affect your current procedures by making some unexpected changes.

Source Code

The collection of programs that causes the software to run.

Strategies

Actions undertaken to reach an objective. Strategies can also be referred to as an "action plan."

Surge Protector

A device which contains electronic circuitry which rapidly responds to excessive current levels. The surge protector is plugged into the electrical supply outlet for a computer, and the computer is then plugged into the surge protector. When sudden current increases occur, the surge protector reacts by diverting the excessive current away from the computer.

Task List

Also called a project task list or timeline. This is a description of all the steps that must be taken in the automation process.

Telephone Line, Analog

This is a telecommunications line that uses tones to communicate information. These lines cannot communicate digital information until it has been modulated into tonal (analog) information. This translation is performed by a modem. These lines come in two grades, voice and data. Voice grade lines are cheaper, but the transmission is of poorer quality. This is the grade used for regular telephone service. Data grade lines are only used for faxes and computers, and are of higher quality.

Telephone Line, Digital

A digital telephone line is a special, high-quality line (99.5% uptime guaranteed, typically), but which cannot carry tones or voice, only digital data. These are sometimes called DDS lines (Digital Data Service). These lines are more accurate, faster, more reliable, and often more expensive than analog lines.

Terminal, Dumb

A workstation with almost no data processing abilities. A typical dumb terminal only knows how to talk to the computer to which it is attached, and therefore is almost completely inert without the computer itself.

Timeline

In this case, a library automation timeline is a listing of project steps and associated completion dates. Timelines can also include an approximation of the amount of time each activity will require and associated milestones.

Title

A system data record containing the bibliographic information concerning a library holding. This information most closely resembles that which is found on a catalog card in the public card catalog. Compare with item.

Title Data Entry/Update

The furnishing of information about bibliographic records to the library automated system. Depending upon the individual system, this information may be keystroked, entered via disk or tape, or may be directly loaded from a bibliographic utility. Title data update is the modification or expansion of bibliographic information already existing in the library automated system.

Title Inquiry

The process of requesting and receiving information regarding a bibliographic record in the database via any of the allowable title access points. Typical access points include combinations, either partial or full, of the following: author, title, subject, call number, publishing date, and keyword.

Turnkey System

An integrated system of preselected hardware and software. Typically all equipment and services are purchased from a single vendor, who also handles maintenance and support for the system.

USMARC

An abbreviation which stands for United States Machine-Readable Cataloging. A magnetic tape format standard originally promulgated by the Library of Congress in 1968 for the purpose of distributing Library of Congress cataloging data. In the United States there are several slight variations of this standard, such as OCLCMARC and RLINMARC.

Uninterruptible Power Supply (UPS)

A device which contains a battery and rapidly reacting electronic circuitry. The UPS is plugged into the electrical supply outlet for a computer, and the computer is then plugged into the UPS. The UPS contains circuitry that detects reductions and losses of electrical power. When such events occur, the computer begins running off the UPS battery for a limited length of time. Many UPS devices also provide surge protection.

Union Catalog

A database comprised of the holdings of more than one library. For example, if neighboring libraries combined their databases to create a single database, it would be a union catalog.

Users' Group

A group of librarians who own a common automated system and who meet to discuss the system's problems, additional needs, upcoming enhancements to the product, and local solutions. An active users' groups can influence product development and company responsiveness.

Vendor

An individual or company that buys and sells library automation or hardware and/or software or other materials acquired by libraries.

Weed

To select items from a library collection for withdrawal or for transfer to a storage area.

Appendix I

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JOURNALS

Because information on computers quickly becomes too old to be useful, the best way to educate yourself is not through books, but through reading journals on a regular basis. The following is a list of journals you might find helpful, with an asterisk (*) indicating the most helpful. All are available from the Library Science Collection (1-800-252-9386).

American Libraries - - news on automation, and often general articles on automation issues

**Computers in Libraries (was Small Computers in Libraries)* - - specifically for libraries using microcomputers

Information Retrieval and Library Automation - - another source of news about automation and changes

Information Technology and Libraries - - LITA/ALA publication; technical and research oriented; primarily academic in scope

**Library Hi Tech* - - very in-depth treatment of topics; usually one per issue

Library Hotline - - every librarian should read this; latest news in automation printed here first

Library Journal - - good automation articles, including the annual marketplace article in April

Library Resources and Technical Services - - academic emphasis, technical, research oriented

Library Software Review - - does just what its title says; some overlap with *Computers in Libraries*

**Library Systems Newsletter* - - edited by Richard Boss; very timely, sometimes technical, but usually useful information on automation

**Library Technology Reports* - - More of a monographic series; in-depth reviews of library systems

LITA Newsletter - - usually contains latest news on standards, committees

School Library Media Quarterly - - a must for school libraries which are automating